The Shadow and the Substance: Architectural Education and Its Relation to Practice with Special Reference to Saudi Arabia

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Abstract

This study takes as its starting point the generally accepted fact that there exists a gap between architectural education and architectural practice in Saudi Arabia. It seeks to answer the following research questions:
What is the magnitude of the gap? How does the gap manifest itself? Where do the causes of the gap lie? How can the problem of the gap be tackled? What further research needs to be done on the question of the training/practice gap?

The researcher undertook a pilot study to explore the nature of the problem, followed by a more extensive field trip to Egypt and Saudi Arabia to gather data. A qualitative methodology, a descriptive approach, a survey type of research design, and an interview data collection technique were adopted.

In order to set the field trip results in context, the study outlines the evolution of the architecture profession and its relationship to the training of architects through history, with special reference to architectural education in three countries, the UK, the USA, and Egypt, which in different ways have had a particularly strong influence on Saudi architectural education.

In view of the basic premiss of the study architectural practice in Saudi Arabia is also examined so as to establish its relationship with the existing architectural schools. What practice does - or in the case of Saudi Arabia perhaps fails to do - affects what happens in the schools and affects the structure, content, and delivery of the curriculum.

Architectural education in Saudi Arabia is described, set in the context of the Saudi educational system in general, as well as in relationship to architectural practice. An account of the emergence of the Saudi architecture schools is given, and details of their structure, students, teaching staff and curriculum are provided, in order to aid the analysis of field trip results.

Using the data from the survey, a thorough and extensive analysis of the researcher's field trip research is presented to show how the gap between education and practice manifests itself with respect to the curriculum of Saudi architecture schools, to the teaching approaches used, and to architectural practice in the country. The survey data forms the basis for the study of the causes of the education/practice gap.

The findings of the study are that the gap manifests itself in various ways: the fact that new architecture graduates are unprepared for what they meet in practice, in particular that the abstract three-dimensional concept of design they are introduced to in architecture school is far removed from the reality of the building process; that they are unfamiliar with office and management procedures; that they have no awareness of the financial and other constraints that attend architectural practice.

In other words the causes of the gap between architectural education and practice are found to lie in education in that much of the curriculum is irrelevant to Saudi practice, in that the curriculum lacks integration, in that teachers are distanced from practice because they are not permitted to practise, in that teaching techniques are unimaginative and inefficient, and in that there is no effective provision for practical training.

Further causes are found to lie in practice, in that practice is not properly organised - there being no effective professional body to control practice, to advise legislative authorities, to establish codes and standards for the profession to follow (and for architectural education to aim at), to accredit architecture school programmes, and to set up and oversee the registration of architects.

The study makes recommendations that would address the problem of the gap between architectural education and practice, in particular the establishment of an effective professional body, the overhaul of the education curriculum, and the setting up of a proper system of practical training similar to that found in Anglo-Saxon countries.

The study makes suggestions for further research, and provides appendices containing the full text of the researcher's fieldwork interviews and an account of the psychology of learning which may provide ideas for further research.

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Abbreviations

ACSA	Association of Collegiate Schools of Architecture
AIA	American Institute of Architects
AIAS	American Institute of Architectural Students
ARCUK	Architects' Registration Council for the UK
GDE	General Directorate of Education
HCEP	Higher Committee on Educational Policy
HEUC	Higher Education and Universities Council
IDP	Intern Development Program
KAU	King Abdul-Aziz University
KFU	King Faisal University
KFUPM	King Fahad University of Petroleum and Minerals
KSA	Kingdom of Saudi Arabia
KSU	King Saud University
MHPW	Ministry of Housing and Public Works
MOC	Ministry of Commerce
MOE	Ministry of Education
MOHE	Ministry of Higher Education
MOMRA	The Ministry of Municipal and Rural Affairs
MOP	Ministry of Planning
NAAB	National Architectural Accrediting Board
NCARB	National Council of Architectural Registration Board
PGE	Presidency of Girls' Education
REDF	Real Estate Development Fund
RIBA	Royal Institute of British Architects
SA	Saudi Arabia
SASO	Specification and Standards Organisation
SOS	Saudi Omran Society
TEC	The Engineering Committee
UIA	International Union of Architects
UQU	Umm Al-Qura University

PART I

An Overview of the Research

Chapter 1

General Introduction

1.1 General Background

> While one must admit that it is POSSIBLE to separate design from practice, the lessons of history, in my opinion, clearly demonstrate that it is UNWISE to do so.
>
> (Louw, 1985)

The researcher first took an interest in the question of the gap between architectural education and practice while studying architecture as an undergraduate at Umm Al-Qura University in Saudi Arabia. He found there that it was regarded as a commonly accepted though regrettable fact about architectural education in the country that there was a gap between the training[1] which a student received and the day-to-day realities of work as an architect. It was felt that a new architecture graduate was simply not ready to do his job, and it was customarily thought that the reasons for this must clearly lie in the nature of the training that he undertook. This awareness of the gap was found amongst both students and teaching staff, something that is still the case today.

Later it became clear that the consciousness of a gap between architectural education and practice, an awareness of the extent to which new architecture graduates were not ready to take up the full reins of professional work, was not confined to students and teachers, but was also generally accepted, as might be expected, amongst architecture practitioners in Saudi Arabia. Indeed, it might even be said that it is amongst practitioners that the awareness of the gap between training and practice is most acute,

[1] In this study the words 'education' and 'training' will be used interchangeably, in line with common usage, except where the reference is clearly to academic education or to practical training. In Arabic there are two separate words (*Taddreeb* 'training') and (*Ta'aleem* 'education') which correspond in usage more or less to their English counterparts, and which are so used both by the researcher and the respondents in the field trip interviews.

since they are the ones who find themselves with graduates on their hands who, it is said, are not properly prepared to take up the work of an architect.

Furthermore, as a survey of the literature will show, the consciousness of a discontinuity between education and practice is not confined to architectural circles only in Saudi Arabia. In such countries as the USA, the United Kingdom, and Egypt voices have also been raised commenting on this gulf, and indeed the ongoing debate about the relationship of education to practice has been a feature of architecture journal articles in the English-speaking world in the last two decades. In view of the differences between the architectural training systems in these countries (See Chapter 4) and that in Saudi Arabia this may initially seem strange, but in fact a close examination of the literature will show that the same basic points are being raised.

Thus, although the main focus of this study is the gap between architectural education and practice in Saudi Arabia, and the particular circumstances that surround it in that country, we note there is much evidence of dissatisfaction with the role of education in the production of architects in countries where the organisation of architectural education and practice is very different from that in Saudi Arabia.

In his paper on the education of the Muslim Architect Kostof (1986) states the following:

> Current architecture education everywhere in the world ill prepares the students for the realities of professional practice . . . Students who come out are rather naive about the economic aspects of building, and the realities of clients. . . They have. . . romantic notions of their roles, and are quite confused as to how they should behave professionally. (p. 6)

The debate about the gap between architectural education and practice takes two general dimensions. One is the relationship between architecture schools and the building industry (Allen, 1992), concentrating on the theme that architectural education is not responsive to day-to-day professional practice needs, i.e. that architectural education does not prepare the student for the world of practice and that graduates lack the practical skills required for successful entry into practice.

The other dimension is not specific to schools of architecture (although the relationship of schools of architecture to the university as a whole is relevant to it), but is the relationship in general between the university and society (Barnett, 1990; Filson, 1985). The 'ivory tower' of higher education is often perceived as being in a position of seclusion from the world, a position of withdrawal from the realities of the social, cultural, and political system. Higher education, on this view, is separated from the needs of society and graduates are not concerned about or aware of these needs.

On the relationship between architectural education and the building industry, Steward (1989) has indicated that in the USA during the past thirty years the relationship between architectural education and practice has provoked recurrent anxiety. He points out that the academy and the profession have long held contradictory views on the curricula of professional schools and the responsibilities of teachers. In the same vein. Gutman (1987) states:

> One of the central issues in architectural education now is the relationship between the subjects taught in the schools and the skills required for successful practice. It is hardly a new problem. Architects have complained about the teaching in the academies at least since the time of the Ecole des Beaux-Arts. (p. 24)

Fox (1984) analyses what he describes as the 'arcadia' of the design studio, the isolation from reality where students are immune to the real-world pressures of practice. Partly as a result of this, and partly from having an idealised view of the nature of architecture, new students have little familiarity with the practical problems of architecture. They see the compromises they will have to make in practice as resulting from the pressures of the non-architect world, and they do not have the simple skills such as teamwork and communication, which are necessary in the practice of architecture.

Gutman (1987) adds that the gap between architectural education and the profession is now perceived to be bigger than ever. And indeed he points out that not only are schools criticised for not preparing students for practice, but that there are those within architectural education who are quite ready to blame the profession for the fact that there is a gap between it and architectural education. He states:

> For every practitioner who complains that students have not learnt how to draw, to talk to clients and deal with contractors and review boards, there is a faculty member ready to denounce the profession

> for the poor quality of its design, its excessive commercialism and its lack of principle and dedication to the art and craft of architecture. (p. 24)

Burn (1996) also comments on the practice of architecture and the causes of the gap that lie within it. Since architecture by its very nature is constantly changing schools cannot be expected to keep up with it. Practitioners do not consult architecture schools before moving in new directions. Burn states in this context:

> Architectural practices have recently emerged from a devastating recession and are undergoing significant changes. Practitioners today must be highly inventive merely to survive, and many are experimenting with new types of practice, new partnerships, and new methods of delivering services and projects. "Practice" is not now as easily defined as it was even five years ago, and so it is harder to educate future architects about it. (p. 4)

In the United Kingdom, as well as the United States, there has been much recent comments on the relationship between university architecture schools and the profession of architecture. Buchanan (1989) writes:

> In Britain, and in most other countries too, architectural education is based upon an increasingly irrelevant role model, that of the architect as an elite professional independent of and superior to the building industry and each architect, if not actually a principal in his own firm, at least a job runner and designer aspiring to genius. But the architect is being reduced to simply another member of the building team, and so of the industry by factors like the increasing complexity of the building industry and the resulting proliferation of all sorts of new skills and consultants, as well as new contracting systems in which the architect is often only one of a team selecting from subcontractor designed elements. (p. 24)

Buchanan goes on to point out that the call for an architect as an all-rounder with his main focus on design is now not so great as it was:

> Also goes the notion of the architect as universal all-rounder. Instead there will he many differing kinds of architects with differing interests, skills and responsibilities and degrees of specialisation. Probably only very few of these will do much design. (p. 24)

O'cathain (1995), indicates that there are insufficient trained architects in society, and that many graduates no longer work as professional architects, but in related fields, for which they receive no adequate training in the architecture schools. Architectural education may be pluralistic, covering a number of different schools of thought, but it seems not to be practical enough.

Buchanan (1989) additionally states in terms that are quite specific, and which in some respects echo the comments of many of the researcher's field work respondents in Saudi Arabia, that the schools do not prepare architecture students for the management side of practice:

> Architectural practices, whatever else they are, are also businesses, and efficient management, continuity of cash flow and meticulous accounting and forecasting of cash, profits and growth, have all become much more critical in the cut-throat world of competitive fee tendering. Yet, though architectural students might be taught something about professional ethics and the finer points of liability, they learn nothing about managing a business - nor such vital skills as attracting and clinching commissions and dealing with staff, consultants and builders. (p. 24)

In the Arab countries there has also been much recent comments on the relationship between architecture schools and the building industry. Fethi et al. (1993) point out that schools of architecture in the Arab countries are theoretical and largely unconcerned with the realities of the world of practice. To test this hypothesis, the researchers examined the role of practical courses such as Construction and its affiliated subjects in Arab architectural education today. A major survey of some 27 departments of Architecture in ten Arab countries was conducted in 1992 to investigate this issue. The survey revealed 'a clear bias towards design, that Construction is taught largely as a distinct and separate discipline unrelated to design: that it is not taught creatively; that current training methods are ineffective; and that there is an obvious lack in research on construction' (p.11).

The prominence given to design in isolation from the actual building process, in a world where many architecture graduates will do comparatively little design in their day-to-day work, is a further global factor in the education/practice gap (Rapaport, 1984: Louw, 1985). It seems that the underlying philosophy behind giving design such a clear preponderance is that in most architecture schools the main goal of architectural education, although this is not explicitly stated, is to produce designers. This carries the implication that, in the minds of whose who construct architecture curricula, the practicalities of architecture are best attained after graduation and in the 'real' world of practice.

But while this argument may be partly valid, teaching design as a distinct and autonomous skill has extremely worrying implications on the educational process in architecture. The lack of co-ordination between design group courses and construction and its affiliated courses had resulted in the entrenchment of the idea that design is the only creative and thus enjoyable process in architectural education (Fethi, et al. 1993; Louw, 1995). On this view all other disciplines, especially construction courses, are essentially mechanical, even boring and subordinate peripherals. This is far from the reality of practice and from the world of built environment production (Gutman, 1987; Louw, 1995; Rapoport, 1984).

The other dimension upon which the debate about architecture schools and practice focuses on the position of universities in relation to society, and on the position of the architecture schools within the university. Universities are often seen, as we have noted, as isolated from the real world. In recent years there have been elements of tension between architecture schools and their universities: architecture schools have often been regarded to some extent as mere technical training establishments, with the result that there has been increasing pressure for the schools to accommodate themselves to the general university ethos as far as academic standards and intellectual rigour are concerned. Burn (1996) points out:

> The relationship between professional schools and the university is based increasingly on common values and procedures; professional schools are now accommodating themselves to the standards and processes that long have dominated the traditional disciplines - the natural sciences, mathematics, and the humanities. To acquire and maintain status in the university, professional school faculties are establishing comparable standards of intellectual rigor, theoretical consistency, and publication records. (p. 24)

This movement on the part of architecture schools, already perceived to some extent as not providing the profession with suitably trained graduates, towards the standards of mother institutions which in themselves are seen as isolated from reality, has meant an even greater gap, in the view of many commentators, between architecture schools and practice. Academic and intellectual rigour, it is claimed, has moved schools yet further from the day-to-day realities of practice. Thus, while it is by no means a universal standpoint, many comment adversely on the emphasis on academic, rather than practical, aspects, on anti-business bias, on confused aesthetics and ethics, and on the stress on knowledge instead of skills. Students are not taught the skills of being a 'good professional', as well as a 'good designer' (Fowler, 1985).

Gutman (1987) traces today's gap between practitioners and educators partly to the schools' new levels of autonomy and their adoption of university-based rather than professional standards. He argues that the recent movement toward professional degrees as prerequisites for licensure increases the influence of academic systems. He states:

> The schools have achieved a new level of independence and autonomy through their absorption into the structure of the universities. Their deans and faculty have adopted the standards of the university and often use these as substitutes for the criteria the profession employs in determining the relevant skill and knowledge. There is dramatic evidence of independence in the fact all schools in the U.S. now set their own studio programs and their own curricula. Along with this, they often appoint and promote faculty who can meet the publication and research standards common in other disciplines, even if the candidates have limited experience in practice. (p. 24)

This theme of the limited experience on the part of architecture school teachers of architectural practice is one that features strongly in the comments of respondents to the researcher's field trip interviews in Saudi Arabia.

Cobb (1985) points out that architecture is seen as a misfit within the university system, something which applies to all professional schools:

> As defined for example by John Henry Newman in his famous discourses on *The Idea of a University*. Newman, writing in the middle of the nineteenth century, maintained that the one great purpose of a university was to provide a "liberal education", which he defined with characteristic eloquence as that "process of training, by which the intellect, instead of being formed or sacrificed to some particular or accidental purpose, some specific trade or profession, or study or science, is disciplined for its own sake, for the perception of its own proper object, and for its own highest culture". (p. 43)

Unlike some commentators on the matter, however, Cobb maintains that universities *have* to have a critical distance from current practice. In his view universities can provide a critical discourse about architecture, creating interaction between scholarship, speculative enquiry, and practice; they can be informing and informed by practice, without trying to direct practice. In turn, architecture can offer much to the university through being a radical critique of modern culture, in the language of forms rather than words. Architecture schools, Cobb maintains, must be open to greater speculative and critical discourse, and must have greater dialogue with the university, to allow greater self-criticism of both bodies.

As with Gutman (1987) the problem for universities, in Cobb's view, is this:

> In welcoming professional schools into their scholarly precincts universities have inevitably had to face the problem of how to connect themselves intimately and productively to ongoing professional work while still preserving an appropriate critical distance from current practice. (1985, p. 44)

The concern about the relationship between architecture education and practice is thus not confined to Saudi Arabia. It has also been articulated in recent years in the United Kingdom and the USA, amongst other places. It was this recognition that the education/practice gap was a matter of general unease in various countries, combined with the fact that it appeared particularly conspicuous and to be attended by particular circumstances in Saudi Arabia, that stimulated the researcher to undertake this present study into the gap's manifestations, causes, and possible remedies, with special reference to that country.

1.2 Statement of the Problem

> The rift between architecture schools and practitioners has never been greater, and the profession as a whole suffers. Is there a way to bridge the education-practice gap? (Crosbie, 1995b)

> A major communications problem between the profession and architecture schools appears to be getting worse. . . At its best, there is a misunderstanding of theory versus practice. At its worst, excessive criticism is destructive to all. (Catanese, 1989)

> Architectural education is in a sorry state. It has failed to keep up with a rapidly changing building industry. And in the studio the acquisition of construction skills and design disciplines has degenerated into irrelevant graphic games. With credibility at such a low ebb the schools are very vulnerable to attack mounted on them by a cost-cutting government in Britain who see these courses as overlong and inefficiently taught. (Buchanan 1989)

> Architectural practice as it is taught in the school is not dovetailed with reality. What we are studying is not used in practice. (Bin-Mahfoz, Saudi architecture student, interviewed 1998)

> There is a gap. It is the gap between what we are educating our students for and what they work as after they graduate. (Mohammed-Ali, Saudi architecture teacher, interviewed 1998)

> I think there is a serious gap, because the schools do not prepare their students to work in practice, as practitioners. (Kurdi, Saudi architecture practitioner, interviewed 1998)

This selection of quotations serves as an illustration that there is a widespread feeling amongst many concerned with the business of architecture that graduates do not come to the profession ready to do the work. This, as we have seen, is not a feeling confined to one particular group within the world of architecture, nor to one particular area or country. The extracts quoted above come from a Saudi student, a Saudi teacher, and a Saudi practitioner, but also from international commentators.

Other examples from various parts of the world and from the pens or the mouths of teachers, practitioners, and students could be cited.. And indeed even as far back as the time of Roman architecture Vitruvius, there was an awareness of the gap. Vitruvius, in his <u>Ten Books of Architecture</u>, stated that the knowledge that an architect needed was 'the child of both theory and practice' (Book 1, p. 6). He believed that architects who learned only the manual skills without the theory never attained the authority their labours warranted, while those who concerned themselves only with theory were 'hunting the shadow, not the substance' (Book 1, p. 6). For Vitruvius, an architect needs a thorough knowledge of both theory and practice.

As far as Saudi Arabia is concerned, none of the respondents interviewed by the researcher during his field trip disputes that there is a gap between architectural education and practice in the country. It is a reality that is agreed upon by teachers, students, and practitioners alike; there is no case of a respondent disagreeing with the researcher when he suggests to them that his observations or their responses indicate that there is a gulf or gap between education and practice

For example, the architecture teacher Barhamain (interviewed 1998) states:

> I want also to tell you that the gap between architectural education and practice does exist; the question is how to reduce it.

The gap between education and practice is also noted by outsiders to the Kingdom. A non-Saudi architecture teacher Ishteeaque (interviewed 1998) says: 'Yes. I think there is a big gap.'

Practitioners too see the gap between education and practice in architecture in Saudi Arabia. The practitioner Shoabi (interviewed 1998) remarks:

> From my experience with new graduates who work in my office and from my experience with students during their summer training I can tell you that there is indeed a gap.

And this is endorsed by his fellow-practitioner Sedairi (interviewed 1998): 'There is a gap between what the students are taught in the school and what they do in practice.' The practitioner Attas (interviewed 1998) also affirms, when asked by the researcher if there is an education/practice gap: 'Yes, that is my experience.'

Students too, in particular those who have completed their summer training experience, are conscious of the gap between their education and practice. Atiah (interviewed 1998) agrees: 'Yes, this is true [that there is a gap] one hundred percent.'

Some interviewees, however, mention that it should be no surprise to find a gap between education and practice in whatever field is being studied. The teacher Barhamain (interviewed 1998) says that the gap 'exists by the way in almost all professions', and the teacher Tarim (interviewed 1998) agrees:

> Yes, I think there is a gap between architectural education and practice. But I think it is a natural gap, a gap you can find in any system of professional education. The theoretical side should be covered in the school, while the practical side should be covered in practice. So our graduates are like any other graduates in the world, prepared with all the knowledge they need, but requiring further experience in practice that they cannot get in the school.

Another teacher, Siddiqi (interviewed 1998) concurs, at least in part:

> There is always a gap between the theoretical training that a student undergoes, particularly related to a profession, and the practice, whether it is medicine, engineering, or architecture.

It is indicated by several interviewees that, although there is certainly a gap between architectural education and practice in Saudi Arabia, it is not the only country where such a gulf exists. The architecture teacher Siddiqi (interviewed 1998) comments: 'Because architecture is creative thinking, there is no limit to it and there will always be a gap. This gap exists all over the world.' And the teacher Hilton (interviewed 1998), like Siddiqi a non-Saudi, when asked whether there is an education/practice gap says: 'Yes, in most places. But it is bigger here.'

But although it is pointed out that there may be gaps between education and practice in other professions as well as architecture, and though it may be acknowledged that the gap between education and practice in architecture exists in countries other than Saudi Arabia, two points are nevertheless made by several respondents. These points are that this education/practice gap within architecture is greater in Saudi Arabia than elsewhere, and that the gap is greater between education and practice within the architecture profession than in other professions. One architecture teacher, Sulaiman (interviewed 1998), states:

> In any system, in relation to any professional education anywhere in the world, there is a gap between training and practice. However, in Saudi Arabia the gap is wider between architectural education and practice than in other parts of the world.

This is backed up by the teacher Siddiqi (interviewed 1998):

> Coming down to issues related to Saudi Arabia, this gap is wider and much bigger. The reasons are many. Education and training in architecture is comparatively new to society. Saudi Arabia started

> the schools of architecture during the 70s. Architectural education, therefore, came much later compared to other professions such as medicine and law.

And Hilton (interviewed 1998), another non-Saudi like Siddiqi, says of the gap that 'it is bigger here.'

While accepting that in Saudi Arabia the gap is greater than elsewhere, the teacher Ghamadi (interviewed 1998) says that it is understandable that this is so:

> It must be remembered that the architectural profession is relatively new in Saudi Arabia, compared to other countries; it is barely thirty years old. So the requirements of architectural practice have not been fully studied yet. That is why architectural education does not reflect the realities of architectural practice.

The problem is not, then, whether there really *is* a gap between architectural education and practice. The chorus of voices from different countries and from various groups involved in the world of architecture maintaining the reality of the gulf is too strong to dismiss, and in any case it accords with the researcher's own personal experience. The crux of the problem facing the researcher is where the main causes of this gap lie. The general opinion seems to be that the causes lie in architectural education - dissenting voices on this issue remain virtually unheard - so that the question for the researcher is not so much *whether* education is deficient, but to what extent education is deficient, what aspects of education or training are inadequate, and whether it is *only* education (as opposed to practice) that is defective. Once the causes have been identified and analysed, the important question becomes one of what ought to be done to address and remedy the situation.

1.3 Manifestations of the Problem

One of the most indisputable factors to emerge from the interviews with Saudi architecture teachers, practitioners, and students is that the gap between architectural education and practice manifests itself very clearly in the shortcomings of graduates when they first start work in architectural practices. This is something that individuals in all three groups of interviewees are aware of, though it is perhaps amongst practitioners that the inadequacies are felt most keenly, since they are the ones who have to try to remedy the situation.

A Saudi architect[2] in an interview with the researcher told him that after he started to work his office wished to build a fence round a section of their property, and he was asked, as an architect, to design and write the specification of this fence. Although this was a small job, he did not know how to do it. He was embarrassed to admit this to his boss as he was just new in the post. He had therefore to go to a private practice in the city to ask them to teach him how to write the fence specification, a service he paid for out of his own pocket. At the time he felt angry with this experience, and felt that he had been misled by the architecture school. He decided to train himself in those aspects of architecture which the school had not prepared him for.

The account of this architect that he was quite unprepared by any aspect of his training for the things he had to do in architectural practice should not be regarded as an isolated anecdote. It is a particularly vivid example of the sort of experience that faces many new architecture graduates and a conspicuous demonstration of the gap between architectural training and practice in Saudi Arabia.

Merely to list the tasks that graduates have been said to be unable to carry out would not be particularly helpful, partly because the same substantive point might be getting made in different words by different respondents, and partly because some of the deficiencies may be felt to be small matters, and others to be of greater importance. However, it is instructive to note that, while most of the shortcomings of new architecture graduates lie in the area of general practice and management capabilities (for example lack of financial awareness) such as might perhaps be expected of new graduates in several professions, there is also a widespread feeling that even in those areas which might be called 'mainstream' architecture activities, such as architecture school curricula might be expected specifically to deal with, many new graduates are seen as inadequate. The manifestations of the education/practice gap that can be seen in new graduates might

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[2] Mohammed Luhabi (interviewed 1998), employed at the Directorate of Design and Construction, Ministry of Interior.

therefore be classified into shortcomings in mainstream or what may be called 'technical' architecture areas, and shortcomings in non-technical (or non-architecture specific) areas, which we may describe as professional practice and management areas.

Highlighting weaknesses in several 'mainstream' architecture areas, a Saudi architecture practitioner comments: 'It is not only in the documentation and construction phases that the new graduate is weak. Even in the design phase, he has some shortcomings that could be mentioned.' (Rifai, interviewed 1998)

Another (Sedairi, interviewed 1998), making the same point about design, states:

> Although the schools of architecture in Saudi Arabia emphasise design over other subjects, the graduates' work is usually superficial at the level of concepts and theories. They usually try to satisfy the functional requirement of a building in their designs. But the overall design, the overall form and appearance of the building lack a philosophy and a concept. For example, they can provide in their works the right number of offices, the right number of lounges, of facilities and so on, but they place all of this in a box. I am talking here about the creativity in design that the new graduates lack. Some of the students try to be creative but they take the wrong path for that. They use in their designs bizarre forms and shapes such as circles and curves without an underlying idea and concept.

Shoabi (interviewed 1998) has a further comment on the design capabilities of new graduates in another interview response:

> There are shortcomings amongst the graduates in their approach to design. When I employ new graduates I usually give them just a small project to do, like a house. So when they start designing the house they begin with a basic shape, say an 'L' shape or a square with a courtyard inside, and then they attempt to adapt other things to this basic shape. However, the right approach to design is to try to understand the relationship of the building to its environment, and whatever shape develops from this approach will be the right shape.

Thus even in design, the one activity that might be said to be *the* distinguishing architectural activity, and the one on which the other curriculum subjects in the schools are centred, new graduates are at times felt to be deficient. It is specifically mentioned by six of the practitioners and even four of the teachers interviewed.

Seven of the practitioners interviewed note the weakness of new graduates in construction, building technology, and structure matters. Speaking about his own period of architectural training Bagabas (interviewed 1998) states that he was not well prepared in

> all the construction process – what goes first, what follows, and so on. It would have been helpful to know more about construction management flow charts. I know that not every graduate needs to know in detail all of these things, but at least every architect should know how a building is constructed.

A similar dissatisfaction is expressed by the practitioner Kamfer (interviewed 1998), recalling his training and relating it to the state of knowledge of new graduates:

> The Structure teacher used to teach us calculations – how to calculate spans, columns, foundations, etc. But these are not what the architect needs in practice. The architect does not do the structural analysis of a building. He needs to know the approximate sizes of the structural elements, and he needs to know the structural vocabulary through which he can interact with the structural engineer. Most importantly, the architect needs to know the potentialities of structural systems so that he can ensure his design concept is buildable, and what structural systems are most suited to his designs in terms of economy, construction, etc.

Several teachers, too, comment on these concerns. Ustankok, an architecture teacher in Saudi Arabia (interviewed 1998) states simply and starkly: 'Students do not have a grasp of the notion of structure.'

The familiarity of graduates with building science is also inadequate according to the practitioner Shoabi (interviewed 1998):

> There is also an inadequacy in the graduates' understanding of the relationship between the interaction of the building and its surrounding environment. For example, do the openings of the windows allow sufficient light and ventilation, or should they be slightly bigger or smaller? The new graduates don't know the basis on which they can judge this. These things have to be resolved by reference to books etc. They are not a matter of guesswork.

Architectural details and specification are also spheres within which new graduates are often considered deficient. Speaking about inadequacies that he still feels after some two years in practice, Ashi (interviewed 1998) states:

> After I graduated and started to work in practice I found that I was underprepared in architectural details and specifications and knowledge about the available building material in the market. After I finish the design I usually meet with clients and they ask me about details such as whether the materials are available in the market or whether they need to be imported, and how much it is going to cost them. And sometimes I am confronted with technical questions about, perhaps, central air-conditioning, to which I do not know the answers.

This perception of architectural detailing and specification as areas of weakness amongst new graduates is common, at least among practitioners, seven of those interviewed speaking about them. Kamel, a practitioner (interviewed 1998), states: 'From my experience with students I find them underprepared in terms of architectural details.' And a similar observation is made by another practitioner, Qurashi (interviewed 1998):

> I think the schools here teach them something about specifications, but all their studies are theoretical; they don't know how to apply their knowledge in practice. Go and ask any graduate to write a primary four-page specification for a house, and I bet you he can't do it. He can't specify the doors, the windows, etc. After he starts work he has to go through a learning process in order to know how to do that.

The practitioner Rifai (interviewed 1998) states: 'They [graduates] need to be better informed on working drawing, and architectural details and specification.' The practitioner Kamel (interviewed 1998) claims: 'I find them underprepared in terms of architectural details.' Yet another practitioner, Sedairi (interviewed 1998), states categorically of students who come to his office: 'They know nothing about architectural details and specification.' An architecture teacher at King Abdul-Aziz university, Tarim (intervived 1998), says of graduates from his own school: 'There are some aspects that are not fully covered in the School, such as working drawing, architectural detailing, and specification.'

The mention by Tarim of working drawing draws attention to the fact that this is a further area where practitioners feel new graduates have insufficient knowledge, it being an area picked out by five of them. Bagabas (interviewed 1998) states:

> Architects in practice need to know how to read working drawings. In the School we were taught this again theoretically. We were taught what working drawing was all about, what its use was, etc. But I never saw an actual working drawing until after I graduated.

And Fayez, a practitioner (interviewed 1998), asserts straightforwardly: 'The graduates are deficient in working drawing,' as does the practitioner Sedairi (interviewed 1998): 'I can also tell you that most of the graduates, if not all of them, are unable to do working drawing'

Another area of limitation amongst new graduates as perceived by interviewees is architectural presentation. The practitioner Sedairi (interviewed 1998) is not impressed by the presentation and computer capabilities of new graduates:

> The students have shortcomings on architectural presentation and model making. Also they don't know how to use computers, and everything is done with computers nowadays.

Amongst students too, especially following their summer training period, there is some awareness that they are not properly prepared even in CAD (Computer Aided Design) when they start work as graduates. Gazawi (interviewed 1998), an architecture student at King Abdul-Aziz University, states:

> If a student wants learn about Autocad he must do so outside the School. There are some students who will graduate without any knowledge about computers, and as you can see from practice every office uses Autocad now; nothing is drawn manually.

It is in general practice and management capabilities, what Richards (1974) calls 'the common-sense skills of day-today practice', however, including dealing with financial matters, that the new graduate is often found to be most lacking, and the gap between education and practice is most clearly manifested (p. 96). By these things are meant not matters that have to do with design or with draughtsmanship, but other things that are not specific to architects' offices. Many of these deficiencies, although they manifest themselves in an architectural context, may perhaps be considered general failures of training, experience, and maturity. New graduates are considered to lack, to a greater or lesser extent, the ability to work to budget, to appreciate and understand the needs of clients as opposed to their own personal interests and preferences, and to work alongside other people, whether colleagues or members of other professions or tradesmen, and so on. Of the interviewees ten practitioners, eight teachers, and even five students, make mention of deficiencies in non-technical matters. One architecture practitioner puts it thus:

> Of great importance for new graduates, and an area in which the gap between training and practice manifests itself, are the non-technical aspects of architectural practice. I mean how to deal with people – any and all kinds of people. They have to learn how to meet with clients, and how to relate within the office itself, how to work with team members. Very few graduates know how to work as a team member, how to respect senior architects, or how to make a junior architect work and tackle his problems. Some of the students are good architects but they don't know how to work with other architects. (Masoud, interviewed 1998)

Masoud also mentions the productive use of time in a working environment:

> One of the major shortcomings [of new architecture graduates] is the understanding of time versus production. In college life time is measured, but at a certain pace, which is very different from the professional pace. When a student comes to an architectural office every hour is measured because someone is paying for it. And because he is paying for it he starts measuring and evaluating time versus production. That is where the biggest gap occurs.

These might not in themselves seem to be criticisms of architects *as architects*, and indeed communicating with people, knowing how to work as a team member, and making optimum use of time are not requirements of the architectural profession alone. Lawyers and accountants, to name just two other professional groups, also need to have these skills. Nevertheless it is this sort of area that deficiencies are most generally perceived, and there is no doubt that teachers, practitioners, and students feel that such general non-technical deficiencies are on the whole *architectural training* deficiencies.

A commonly mentioned non-technical inadequacy in new architecture graduates is the failure to appreciate the financial and economic realities of the world of business. Seven out of the ten practitioners who mention graduates' weaknesses in non-technical matters speak of this, as do six out of the eight teachers. For example Kamfer, a practitioner in private practice in Saudi Arabia (interviewed 1998), comments:

> In building economics the student needs to know about feasibility studies, cost analysis, etc. He needs to know approximately how much a building will cost. He needs to know how to make a building less expensive. He doesn't need to do all of these, of course, but he needs to know about them. And unfortunately in the school he is not exposed to these issues.

Speaking of the inadequacies exhibited by students after they finish their courses one Saudi teacher, Akbar (interviewed 1998) says: 'Another example is the cost of the building. The student does not take into consideration how much the design will cost, or how to design to a limited budget.' And another teacher, Rageeb (interviewed 1998), admits: 'Our students do not take into consideration economic factors.' Yet another teacher, while acknowledging that there are weaknesses in this area, sees the root of the problem as lying in the lack of school training in budgeting and other financial matters: 'Unfortunately professional matters such as office administration, finance, and economics are not taught in the School' (Hariri, interviewed 1998).

The practitioner Sedairi (interviewed 1998) is quite clear about the lack of financial expertise amongst new graduates: 'While most of the graduates can do basic design their designs lack practical aspects. For example, they cannot design to budget.' The practitioner Attas (interviewed 1998), complaining about the weaknesses of new graduates, also picks out the lack of financial training as something that has consequences in practice. He states: 'In the schools the students are not taught about budget, cost, etc. . . . But in practice there are constraints, such as budgets, regulations, client needs, etc.'

New architecture graduates are also considered to have poor general administrative skills. An architecture teacher, Haikal (interviewed 1998), states:

> Why don't we teach our students report-writing skills? I always ask my students to write a two-page report about their final project, but unfortunately they cannot do this. It is not their fault; it is the fault of the system.

Along this line, Attas, a Saudi practitioner (interviewed 1998), says:

> New graduates lack the awareness of management structures and lines of responsibility, such as the preparation of reports. I sent a graduate to write a report about a building needing repair and he didn't know how to do it.

Shoabi (interviewed 1998) says of graduates who come to work in the office where he practises:

> They do not know how to get the information they need from references; they don't know how to get details, regulations, standards, etc., although we have all the material in our office.

Again, this is a point about general capabilities, though manifested in an architectural context, and not about 'mainstream' architecture matters. Inability to look up reference material would be a deficiency in a graduate professional in any field, not just architecture. Attas, an architect in government practice (interviewed 1998) comments:

> The architect in the municipality does not work only as a designer but as an administrator, and the schools fail to prepare their students to work in the government, where all architects are involved in administration.

Once more, although this is not a technical weakness in an architect *as architect*, it is perceived as a training weakness; it is the *school* that is criticised for failing to prepare students properly.

Other areas of inadequacy mentioned by some teachers or practitioners include site supervision, knowledge of traditional Islamic architecture, knowledge of building materials, knowledge of laws and regulations, and project management.

1.4 Objectives of the Study

There are two main objectives to this study. It will aim, firstly, to investigate the phenomenon of the gap between architectural education and practice with special reference to Saudi Arabia. The study will seek to establish the nature and extent of the gap between education and practice and its causes. Full use will be made both of the existing literature and research in the area covered, and of information gathered through fieldwork, which consists largely of interviews with architecture teachers and students in the schools of architecture, and with practitioners, in Saudi Arabia (See Appendices I, II, and III).

The second primary objective will be the putting forward of recommendations aimed at bridging or at least reducing the gap within Saudi Arabia. This objective, while taking up less of the body of the text of this study, is no less important than the first. Indeed, it might be said that the first objective, investigating the nature and causes of the gap between architectural education and practice, is secondary to the second, for it is already plain that a serious gulf exists, and that the situation calls out for a remedy. It is also clear that the greater bulk of the researcher's work will be taken up with the first, investigative, objective. For it is only through a thoroughgoing inquiry into the phenomenon of the gap that its nature and causes, and thus possible solutions, can be fully exposed.

1.5 Research Questions

A number of research questions have to be put in order that the objectives of this study may be achieved. These are not all questions of equal importance or consequence. Indeed if a schematic display of the questions were set out, it would show that there is a hierarchical relationship between some of them. Some questions are, as it were, sub-questions or follow-up questions of others.

The researcher's personal experience, a survey of the literature, and the interviews carried out during the researcher's field trip indicate that there is a wide gap between architectural education in Saudi Arabia and practice. This is the starting point for further investigation. The research questions that have to be addressed, then, include the following:
How does the gap manifest itself? This breaks down into a number of typical secondary questions:

What is it that new graduates are not properly trained to do?
How widespread, across the world of architecture, is the gap?

At what stage in the career path of an architect or trainee architect is the gap most evident? To whom is the gap most obvious? Teachers? Practitioners? Students?

Where do the causes of the gap lie?

In the schools? If the causes lie in the schools are they in the curriculum? If the curriculum is to blame, is it the content or the structure that is deficient?

If the causes do not lie in the curriculum, do they lie in its delivery, in other words with the teachers? If the teaching is at fault, is this a systematic fault or deficiencies of individual teachers?

In inadequate practical training? If so, is this because the practical training is too short and perfunctory? Is it because the practical training is carried out at the wrong time in the student's career path? Is it because practical training is not delivered properly, and if so, who is to blame for that?

In practice itself? Is practice organised? *Should* practice expect new graduates to be fully trained? Is practice moving too quickly for architectural education? Should practice itself be monitored for training input?

How can the problem of the gap be tackled?

If a major cause for the gap has been identified, can it be bridged? Will changes in attitude suffice, or are major structural changes required? Who will listen to the suggested solutions? Is it practical to attempt to change?

What further research needs to be done on the question of the training/practice gap?

These are the research questions which have to be asked. It should not be forgotten that, while the questions will be posed in relation to various countries, the special reference of this study is the Kingdom of Saudi Arabia and architectural education there. It is particularly with that reference in mind that questions about solutions and recommendations will be made.

1.6 The Structure and Organisation of the Study

This study will be presented in three main parts. Part I, <u>An Overview of the Research,</u> consists of two chapters. Chapter 1 sets the background to the study. It states the problem to be addressed, and outlines the purpose, organisation, and limitations of the study. Chapter 2 deals with the techniques and procedures used in the gathering of information relevant to the study. It describes in particular the fieldwork undertaken, the philosophy behind it, and the acquisition and interpretation of information collected.

Part II, Architectural Education and its Relation to Practice: A General Survey, contains three chapters. Chapter 3 deals in a descriptive and historical way with architectural training through the ages and the main systems used for its delivery. Chapter 4 surveys architectural training in three countries in particular, the USA, the United Kingdom, and Egypt. Chapter 5 provides a general account of architecture and architectural practice in Saudi Arabia.

Part III, Architectural Education in Saudi Arabia and its Relation to Practice, has four chapters. Chapter 6 will give an account of the general and higher educational context in the Kingdom. In Chapter 7 covers architectural education in Saudi Arabia, including the history of the schools, their human and academic resources in training architects, and their relation to the world of architectural practice. Chapter 8 considers in detail the architecture curriculum in the country. Conclusions and recommendations are offered in Chapter 9, the final chapter. There follows a bibliography and the appendices.

The appendices are extensive and form a most important part of this study. They include the full texts of the personal interviews conducted by the researcher during his fieldwork in Saudi Arabia. These interviews are with three classes of persons: Saudi architecture teachers, Saudi architecture practitioners, and Saudi architecture students. The interviews with teachers and practitioners were conducted on a one-to-one basis, and those with the students were group interviews. The information gathered through the interviews informs the entire study, and material from them is cited at various points in the thesis.

1.7 The Limitations of the Study

This study is made with special reference to and with a special focus on architectural education in Saudi Arabia. While the problem addressed – the gap between architectural education and practice – is one that manifests itself in various countries, the chief concern of the researcher is to throw particular light upon the nature of the problem, the causes of it, and the possible remedies for it in that country.

The historical perspectives given on architectural education, and the accounts given of it in the USA, the United Kingdom, and Egypt, are therefore provided primarily to highlight the situation in Saudi Arabia. The importance of the USA, the United Kingdom, and Egypt lie, for the purposes of this study, in the influence they have had on architectural education in Saudi Arabia.

This thesis is also not primarily concerned with pedagogical theory or with the psychology and philosophy of education, except insofar as a consideration of those subjects has illuminated or may illuminate the question of the gap between architectural education and practice and its causes, and insofar as an understanding of pedagogical matters can contribute to its possible remedies. A consideration of the various theories of learning and how they relate to the student's assimilation of knowledge in the context of architectural education is a topic of such magnitude that it deserves the attention of a fuller study (See Chapter 9). However, it is with the recognition in mind that the behaviourist and cognitive theories of learning may be able to illuminate the particular processes by which an architecture student may receive and integrate the information that is imparted to him that an account of the main points of these theories is provided in Appendix VI.

Though due notice will be taken, for example, of the view that part of an architect's education should include academic training in the humanities in order to awaken and nourish a student's awareness of the place of architecture in human accomplishment, or courses in art in order to establish the aesthetic basis of design and stimulate the student's creative instincts, the study will essentially be an empirical exercise, seeking to establish facts by objective observation and scientific (in the widest sense) analysis.

Further parameters within the study has to apply include the fact that it was produced primarily with the Saudi reader in mind. This means that sources which are not readily accessible to the Saudi reader are sometimes quoted more elaborately than is strictly necessary.

The researcher has in some cases used the same quotations from the testimony of interviewees in separate locations within the study to support or to illustrate different points. This has been one beneficial result of the semi-structured interview approach adopted for this study, as it has allowed the respondent to make unprompted links and comparisons in his own words, and has considerably enhanced the quality of the research.

The study has been to some extent handicapped by the fact that in Sauid Arabia material such as official papers and statistics are not well archived, if they exist at all. This has meant that the researcher has on some occasions faced considerable difficulties accessing and retrieving information from official sources, since obtaining data is often a matter of personal contact and referral. Success in this is therefore usually dependent on the attitude or competence of the individual consulted rather than following a systematic retrieval route.

Chapter 2

The Research Approach and Methodology

2.1 Introduction

The general background to this study and the problem of the gap between architectural education and practice with which it deals has been set out in Chapter 1. This chapter will primarily deal with the fieldwork undertaken by the researcher in Saudi Arabia in order to substantiate and expand upon the indications about the nature, extent, and causes of the education/practice gap which had been gleaned from the literature and from personal experience and observation. A brief account of the sources used in the researcher's literature survey will also be given.

In order to carry out this fieldwork research a number of decisions about methodology, research design, method of data collection, and sampling approach had to be made. This chapter describes the various options open to the researcher and explains the reasons behind the decisions to adopt the particular techniques and procedures that were used.

A detailed account of the fieldwork is also provided, covering the preparation and planning stage, the timetable followed, the locations, selected interviewees, and conduct of the interviews, the transcription of the interviews, and the analysis of the information they provide. Full details of the persons interviewed, whether architecture teachers, practitioners, or students, are given in order to demonstrate the comprehensive sweep of the investigation. Tables providing relevant details are supplied.

2.2 The Research Methodology

Research methodology or strategy is best characterised as the matching of a basic research objective with a specific research method. In a fundamentally empirical enterprise like the greater part of this study, the research objective will be primarily the gathering of information or data. Churchill (1992) states, 'In terms of data collection all studies fall into one of two categories – qualitative or quantitative.' The distinction between the two is described in different terms by different writers. Some, such as Cohen and Manion (1994), who define methods as 'that range of approaches used in educational research to gather data which are to be used as a basis for inference and interpretation, for explanation and prediction' (p 38), stress the objective or positivist philosophy lying implicitly behind the quantitative method, a philosophy which sees the world of natural phenomena as 'hard, real, and external to the individual' (p. 7). The qualitative method is more in line with 'the alternative view of social reality which stresses the importance of the subjective experience of individuals in the creation of the social world' (p. 8). Others, e.g. Barhamain, 1997, characterise the difference in more prosaic terms as a matter of questioning sequence. The researcher had to choose which of these approaches to adopt in seeking to illuminate the question of the gap between architectural education and practice. A brief account of each is given below.

2.2.1 *Quantitative Method*

> Quantitative research is a basic strategy of social research that usually involves analysis of patterns of covariation across a large number of cases. This approach focuses on variables and relationships among variables in an effort to identify general patterns of covariation. (Ragin, 1994, p. 190)

This working definition serves to illustrate the main points about quantitative research, sometimes, as we have seen, called the 'positivist' method (Cohen and Manion, 1994), namely that it usually involves large numbers and that it concentrates on variables. A quantitative approach is used when the researcher wishes to deal with a small number of variables in an attempt to explain some aspect or aspects of the phenomenon under investigation. (In this context this use of a small number of variables is usually called 'parsimony'.) Its methods are also best suited to situations where variables are most easily identified and controlled. For instance a researcher may wish to establish whether there is a correlation between height and place of birth. Once it has been decided what the height threshold, or the various height thresholds, to be used are, it is easy to measure them. Similarly once it established whether place of birth is to be as wide in range as a country or state, or as narrow as a specific city or registration district, then it is easy to identify from the data available. Again, if a study is to be made about whether tasks are performed better in the morning or the afternoon, then it is within the control of the researcher or his team to isolate two groups and give one of them the tasks to perform in the morning and the other the tasks in the afternoon, with conditions otherwise as far as possible unchanged, and so on. Obviously, such a method cannot establish much if it simply uses a few cases. The images that quantitative researchers construct are based on general patterns of variation across very many cases. Often thousands of cases are used by researchers utilising the quantitative approach. (Ragin, 1994). Barhamain (1997), whose own study, involving large numbers of persons attending a mega-event, is more suited to the quantitative method, describes it thus:

> Quantitative methods deal with the quantification of respondents' behavioural and personal characteristics. It [sic] is concerned with describing and measuring concepts or variables. By using quantitative research, the conceptual approaches to problem solving are explicit and fixed, using an agreed tool for measuring. Statistical tests are usually employed to indicate whether a particular relationship or the difference between groups is significant. (p. 84)

It certainly seems clear that, prima facie, such a method would not be particularly suited to this study, which deals largely with human perceptions and reactions. Patton (1990) writes:

> Quantitative methods . . . require the use of standardized measures so that the varying perspectives and experiences of people can be fit into a limited number of predetermined response categories to which numbers are assigned. (pp. 13-14)

It is perhaps not hard to see in this quotation a more dismissive description than would have been given by a scholar more sympathetic to quantitative methods. Nevertheless it does seem to encapsulate the drawbacks of the quantitative method in the case of the research carried out by this study.

There is the further consideration that it would simply have been logistically impractical to attempt to observe or survey hundreds or perhaps even thousands of architecture teachers, students, and practitioners in the same situation, or to have sought the response of so many to, say, the same series of questionnaire questions. There would also have been the problem of how to categorise responses. Unless a questionnaire technique of data collection had been adopted and a questionnaire of the 'please check boxes' type had been provided, then even if the other logistical and control difficulties could have been overcome, responses would not have had the clear-cut certainty which allow them readily to be quantified and analysed (See Section 2.5.1 and 2.9.2). There is also the more tedious down-to-earth reality that this method can have a low response rate: questionnaires are often left unanswered.

2.2.2 *Qualitative Method*

> Qualitative research is a basic strategy of social research that usually involves in-depth examination of a relatively small number of cases. Cases are examined intensively with techniques designed to facilitate the clarification of theoretical concepts and empirical categories. (Ragin, 1994, p. 190)

When seeking to gather information about attitudes, perceptions, and responses, the qualitative method is more suitable. Here the main interest is with a comprehension of the way in which people interpret, modify, and shape their surroundings. Qualitative method is sometimes described as a 'phenomenological' approach. The German philosopher Edmund Husserl (1859-1938) is generally seen as the father of phenomenology, and he was primarily concerned with a philosophical approach which sought to investigate how people experienced things through their senses as phenomena. Patton (1990) writes:

> Put simply and directly, phenomenological inquiry focuses on the question: 'What is the structure and essence of experience of this phenomenon for these people?' . The phenomenon being experienced may be an emotion – loneliness, jealousy, anger. The phenomenon may be a relationship, a marriage, or a job. The phenomenon may be a program, an organization, or a culture. (p. 69)

Qualitative method seeks 'insight rather than statistical analysis' (Maxwell, 1996, p. 6). The inherent danger of using qualitative techniques is that there might be a loss of rigour, with vague and subjective impressions masquerading as information collected through careful and well-designed research (Mason, 1996), the more so, perhaps, because the measuring tool, as it were, of qualitative method is the researcher himself. Guba and Lincoln (1981) write:

> [Since] the inquirer himself is the instrument, changes resulting from fatigue, shifts in knowledge, and cooptation, as well as variations resulting from differences in training, skill, and experience among different 'instruments' easily occur. But this loss in rigor is more than offset by the flexibility, insight, and ability to build on tacit knowledge that is the peculiar province of the human instrument. (p. 113)

Provided the researcher is aware than he is himself a variable in qualitative research, and that his own reactions might influence the attitude and reactions of respondents, then the advantages it offers seem decisive in the case of the present study. Bogdan and Biklen (1982) write:

> Qualitative research has the natural setting as its direct source of data and the researcher is they key instrument. Researchers enter and spend considerable time in schools, families, neighbourhoods, and other locales learning about educational concerns . . . the data is collected on the premises and supplemented by the understanding that is gained by being on location. (p. 27)

The qualitative method offers the opportunity to be adaptable, to react flexibly to the information provided by respondents, to pursue new lines of inquiry, to abandon those which, in any one instance, appear to be leading nowhere, to probe for further information, and to go into greater depth in any one case or on any one point. There are sampling and interview techniques, discussed below, available for use in conjunction with the qualitative method, which afford it the appropriate degree of rigour and objectivity.

In writing about qualitative method, Mason (1996) wishes to emphasise the rich variety of qualitative research strategies and techniques. However, she stresses that it is useful nevertheless to look for some common elements, so that it is possible to develop a sense of what is qualitative about qualitative research. She offers therefore a loose, working definition which states that qualitative research is:

> • grounded in a philosophical position which is broadly 'interpretivist' in the sense that it is concerned with how the social world is interpreted, understood, experienced or produced. Whilst

different versions of qualitative research might understand or approach these elements in different ways (for example, focusing on social meanings, or interpretations, or practices, or discourses, or processes, or constructions) all will see at least some of these as meaningful elements in a complex - possibly multi-layered social world.

• based on methods of data generation which are flexible and sensitive to the social context in which data are produced (rather than rigidly standardized or structured, or removed from 'real life' or 'natural' social context, as in some forms of experimental method).

• based on methods of analysis and explanation building which involve understandings of complexity, detail and context. Qualitative research aims to produce rounded understandings on the basis of rich, contextual, and detailed data. There is more emphasis on 'holistic' forms of analysis and explanation in this sense, than on charting surface patterns, trends and correlations. Qualitative research usually does use some form of quantification, but statistical forms of analysis are not seen as central. (p. 4)

In dealing with the gap between architectural education and practice in Saudi Arabia, what is of concern is a potentially infinite number of variables, which cannot be predicted, let alone quantified and measured as if they fell within clearly defined and identifiable parameters. There are also, in comparative terms, relatively few respondents. This is suited to a less tightly structured and more open-ended approach than that demanded by the quantitative method.

Qualitative method is also more suitable when, as in the case of this study, there is no research background available on the area covered by the fieldwork. There has not been an ongoing debate in the literature about the problem of the gap between architectural education and practice in Saudi Arabia. There was therefore no extensive body of work for the researcher to draw upon, and upon the basis of which he could construct a questionnaire which covered all the relevant areas and only the relevant areas.

McCracken (1988) writes:

> When the questions for which data are sought allows [sic] the respondent to respond readily and unambiguously, closed questions and quantitative methods are indicated. When the questions for which data are sought are likely to cause the respondent greater difficulty and imprecision, the broader, more flexible net provided by qualitative techniques is appropriate. (p. 17)

When the advantages of the qualitative method in the case of this study and the disadvantages of the quantitative method, outlined above, are considered, it is clear that the qualitative method is the one that is appropriate, and it is the one that has been adopted for this research.

2.3 The Research Approach

There are three common research approaches utilised by researchers in the social sciences; these are the historical approach, the experimental approach, and the descriptive approach. A brief account of each of each is given below.

2.3.1 Historical Approach

> Historical research is an attempt to establish facts and arrive at conclusions concerning past events. The historical researcher must systematically and objectively locate, evaluate, and interpret evidence available for understanding the past. From this evidence he hopes to show what may be contributed by past experience to a greater understanding of present situations and what might happen in the future. (Ary, et al., 1972, p. 283)

This statement should be treated with some care, as it offers both a working definition and an assertion about an accidental, but not defining, characteristic of much historical research. It is important to see that both of these are there, and that there is a distinction. It may very well be true that historical researchers generally carry out their research in order to illuminate the present and help to predict the future, and indeed in the context of educational research it may be an objective that is always present. But historical research would still be historical research even if there were no intention to use its findings to understand the present. It could be done simply to find out more about what happened in the past.

Nevertheless, given that historical research is commonly carried out for the purposes set out by Ary et al., can it be of any value in the present study? The answer to this question is Yes, but only in a very limited way.

Chapter 3 includes an account of the various types of architectural training that have been developed through the ages, and also an account of architectural education in three countries - the USA, the United Kingdom, and Egypt - which deals partly with the history of architectural training in those countries. Also, Chapter 4 includes an account of the present-day architectural scene and its relation to the history of the practice of architecture in the country concerned. Clearly, the historical approach has to be used, where appropriate, in such an undertaking. As such it is liable to its inherent drawbacks. Ary et al. again:

> The historian has no choice regarding what documents, relics, records and artifacts will remain for his studies. Only when he is interviewing witnesses of past events can the historian decide what questions are to be asked or what is to be measured, and even in such cases he can measure only those things his witnesses both noted and remembered. . . The historian can study only those [persons] for whom records and remains survive. . . The historical researcher cannot assume that something did not take place simply because no record of it can be found. (p. 284)

The historical method is also appropriate to research into the background to architectural education in Saudi Arabia, and its techniques have been used for that purpose in this study, when the researcher was in the process of building up the background to his fieldwork. However, its value has been limited. The problem is mainly that there is not much of a past in architectural education in Saudi Arabia to lend itself to such research. Furthermore, there is not a wealth of archives for the researcher to delve into in the context of Saudi architectural training, since the architecture schools by and large have not kept records of their students. In other words there is not a great deal of history of architectural education in Saudi Arabia to research, and in any case there is little in the way of evidence to access about it.

When the question of what research approach the researcher should use in his fieldwork arises, however, it is clear that the historical approach cannot provide all the answers.

He is dealing in this instance not with past events but with present perceptions and current practice.

2.3.2 *Experimental Approach*

Writing about the experimental approach Cohen and Manion (1994) state:

> The essential feature of experimental research is that the investigators deliberately control the conditions which determine the events in which they are interested. At its simplest, an experiment involves making a change in the value of one variable - called the independent variable - and observing the effect of that change on another variable - called the dependent variable. (p. 164)

The independent variable is manipulated in some way while other variables are kept unchanging under strict control to see the effect on the dependent variable. The effect of the independent variable on the dependent variable can then be isolated, and because of that the researcher can draw conclusions about this effect.

However, this type of approach is limited to research where it is possible for the researcher to control independent variables, such as that conducted in a laboratory. It is a popular method for use on the pure sciences where variables can be strictly managed. In research in the social sciences, including education, which involves human beings acting and interrelating with one another, making decisions, evaluating and assessing, there is no possibility of the degree of control or management appropriate to the experimental approach. It is therefore impossible to select it as the research approach for this study.

2.3.3 *Descriptive Approach*

> Descriptive research studies are designed to obtain information concerning the current status of phenomena. They are directed toward determining the nature of a situation as it exists at the time of the study. There is no administration or control of a treatment as is done in experimental research. Their aim is to describe 'what exists' with respect to variables or conditions in a situation. (Ary et al., 1972)

The principal aim of the descriptive approach is to give an accurate representation of things as they are, in Foucault's term 'the history of present'. The descriptive approach, that is to say, is concerned to account for the situation facing the investigator. In this type of research the researcher is typically concerned with providing a picture of variables such as age, occupation, financial status, and so on. The descriptive approach requires some previous acquaintance with the problem to be investigated, and the researcher must be able to assess as relevant or appropriate the responses, reactions, and concepts that he meets while carrying out his study (Adams and Schvaneveldt, 1991).

The focus of the descriptive approach is usually on events that are taking place (or in some cases have taken place), so that the researcher may not vary or control the events under examination, though he may vary his description and observation methods. Typically, the descriptive approach involves much more, however, than mere observation, collecting data, and analysing it. It involves, as noted by Adams and Schvaneveldt (1991) 'interpretation, contrast, classification, and integration of findings' (p. 107).

Good (1972) helps to clarify the purposes of the descriptive approach when he states that this type of research seeks to obtain evidence concerning a situation or population, identifies norms or baseline information which can be used for comparative purposes, and finally it serves to determine whether and what sort of further research is indicated.

The descriptive approach suggests itself in the case of the present research because it seems well suited to the situation facing the researcher. As stated by Barhamain (1997):

> It does not require an experiment and can be carried out in a natural setting. This type of research design is most appropriate in research where the researcher cannot alter the natural setting of events . . . The researcher is not able to modify or control the independent variables because of their nature. (p. 88)

It is certainly the case that modification of variables is not possible in the case of the present study. It is not possible, for instance, to set up and then observe architecture students being instructed by competent teachers (this being determined according to some independent criteria) during the length of their course, and then observing the same students, in the same conditions, being instructed this time by incompetent teachers (independently determined), and then see the effect. Some, such as Sproull (1988) see this as a weakness in the descriptive approach, claiming that it cannot lead to conclusions about causes, only about association or relationships. This is in itself contentious, since it is strongly embedded in the empirical philosophical traditions of the English-speaking world that a rigorous analysis of cause and effect will indeed explain it in terms of association and relationships, and nothing more.

But in fact the present study, descriptive though the approach may be, need not hesitate to draw conclusions where appropriate. If, in the perception of a large proportion of the respondents, there is a gap between architectural education and practice partly because some of the teachers are poor, it is too severe to say that there is no potential for reaching conclusions here. Few would contest the assertion that, whatever other factors may be involved, poor instructors make for poor training.

It is clear in view of the above considerations that the type of research approach most suitable to the study being undertaken is the descriptive approach, and this is the one that has been selected.

2.4 The Research Design

There are two broad categories of research design: case studies and surveys. Some scholars add further categories, such as cross-sectional approaches and longitudinal approaches - where data is taken from the same subjects on the same topics over a period of time - (Adams and Schvaneveldt, 1991). However, even those who do so accept that the two-category split is the basic one. Adams and Schvaneveldt (1991) write:

> From an integrative perspective it is evident that case studies have a lot in common with longitudinal designs, while cross-sectional and survey approaches are really variations of the same design. (p. 114)

2.4.1 The Case study

Case studies are limited to a small number of subjects, in some instances just one, and lend themselves to a detailed, comprehensive, in-depth approach. The concentration on such a small number means that a great quantity of variables can be examined. Typically a case study approach is used when there is a need to evaluate individual subjects, or when a particular case stands out because of some striking or anomalous aspects. An in-depth case study may also be carried out for illustrative purposes, when previous research has provided useful generalisations, and if one particular case may be regarded as an especially illuminating example.

Case studies typically proceed by observation, without any attempt on the part of the investigator to control or manipulate variables, and without the (more or less) standardised questions characteristic of the survey researcher (Cohen and Manion, 1994).

The use of case studies may also be indicated when other types of research design are regarded as suspect for reasons of impracticality. Writing of the use of case studies in an international setting, Patton (1990) states that some international agencies are

> advocating much greater use of case studies, largely for practical reasons. Case studies are manageable, and it is more desirable to have a few carefully done case studies with results one can trust than to aim for large, probabilistic, and generalizable samples with results that are dubious because of the multitude of technical, logistic, and management problems in Third World settings. (p. 100)

A case study approach in the case of this present research would have the advantage that it is usually carried out in its natural setting, with no attempt to control or manage variables being necessary. The small number of subjects in case studies, however, mean that there are problems in drawing general conclusions, and of course with the case study approach there is the question of whether the cases, except when chosen for illustrative purposes, are representative of the total group in the way an investigator believes.

2.4.2 The Survey

This is perhaps the commonest type of research design in educational research. A survey attempts to effect the collection of data or information from a population sample at a specific time, typically by questionnaire or interview. It is not a method where the researcher usually attempts to control or manipulate variables, and it is particularly suited to a descriptive research approach. The survey method is flexible, and surveys may be relatively simple or relatively complex, capable of presenting relational analysis (Cohen and Manion, 1994).

On the whole, survey samples tend to be fairly large, and the emphasis is not on individual subjects but rather on the generalised results that a survey can offer (Adams and Schvaneveldt, 1994).

A survey requires careful planning, and may be affected by such factors as the finance and time available to the researcher or team of researchers. Cohen and Manion (1994) outline what a survey commonly involves:

> Whether the survey is large-scale and undertaken by some government bureau or small-scale and carried out by the lone researcher, the collection of information typically involves one or more of the following data-gathering techniques: structured or semi-structured interviews, self-completion or postal questionnaires, standardized tests of attainment or performance, and attitude scales. Typically, too, surveys proceed through well-defined stages. (p. 83)

The survey suggested itself as the appropriate research design in the case of this study, being well suited to the other methodological decisions taken regarding method, approach, and sampling techniques, and to the needs, resources, and existing state of knowledge of the researcher.

2.5 Data collection method

There are two common data collection methods used by researchers in the social sciences, and these are the questionnaire and the interview.

2.5.1 The Questionnaire

The questionnaire is a common tool in education research. Writing about the questionnaire, Borg (1981) states:

> The questionnaire usually contains questions aimed at getting specific information on a variety of topics . . . Questions may be of either the closed form, in which the question permits only certain responses (such as a multiple-choice question), or the open form, in which the subject makes any response he wishes in his own words (such as an essay question). Which form will be used is determined by the objective of the particular question. Generally, though, it is desirable to design the questions in the closed form, so that quantification and analysis of the results may be carried out efficiently. (pp. 84-85)

It is at once clear from this that the questionnaire method of data collection does not present itself as the most immediately obvious method to carry out the present study. The present study seeks to elicit reactions, responses, and perceptions, not primarily factors that are easily quantifiable (See Sections 2.2.1 and 2.2.2 above, and 2.9.2 below), and which are more suited to the flexibility that can be offered by interviews.

Questionnaires, to be used satisfactorily in a qualitative study, also required to be very long in order to elicit the type of response needed, and they also suffer from disappointing response rates, partially perhaps because of postal problems.

On the credibility of qualitative research, the value of the questionnaire is also debatable. In some ways, the use of a questionnaire ought to increase reliability, since the questions will be constant for all respondents, free of sequence changes, different wording, changes of tone or emphasis, quizzical looks, or any other feedback from an investigator, and so on. In other words, they will be free of any bias or effect from the researcher. But despite the reliability of the questionnaire as an instrument, qualitative research often calls for probing, explanation, follow-up questions, and so on, which are not possible with a questionnaire. Further, if a question is misunderstood it may be ignored or not answered properly in a questionnaire. The validity of the study may therefore be undermined. Indeed, there is a case for saying that the more controlled and unchanging the questions – as in a questionnaire – the greater the validity is compromised. Kitwood (1977), writing about the tight control of questions (typical of the questionnaire), which he calls 'rationalization', states:

> In proportion to the extent to which 'reliability' is enhanced by rationalization, 'validity' would decrease. For the main purpose of using an interview in research is that it is believed that in an interpersonal encounter people are more likely to disclose aspects of themselves, their thoughts, their feelings and values, than they would in a less human situation. At least for some purposes it is necessary to generate a kind of conversation in which the respondent feels at ease. In other words, the distinctively human element in the interview is necessary to its 'validity'. The more the interviewer becomes rational, calculating, and detached, the less likely the interview is to be perceived as a friendly transaction, and the more calculated the response is also likely to be. (p. 75)

Nevertheless, the use of a questionnaire as the primary data collection method was in fact considered for this present research (See Appendix VII for the pilot study questionnaire), and in a pilot study the researcher sent out five questionnaires for review. Of these, only two came back, and these were from fellow Ph.D. students in the United Kingdom.[3] They advised that the questionnaires were too long and not, in their opinion, likely to yield the sort of information sought in the Saudi situation.

2.5.2 The Interview

In relation to interviews and the qualitative research method, which is the one that will be followed in this study, Patton (1990) writes:

> The purpose of interviewing is to find out what is in and on someone else's mind. The purpose of open-ended interviewing is not to put a thing in someone's mind (for example, the interviewer's preconceived categories for organizing the world) but to access the perspective of the person being interviewed . . . Qualitative

[3] Sami Barhamain (University of Strathclyde), and Abdulghani Monawar (University of Newcastle).

> interviewing begins with the assumption that the perspective of others is meaningful, knowable, and able to be made explicit. (p. 278)

Scholars vary in the terminology they apply, but there is wide agreement that research interviews may be divided into three main categories, and these categories are substantively the same, whatever names they are given. Borg (1981) names these three types as follows: the highly structured interview, the unstructured interview, and the semi-structured interview, and they will be briefly dealt with below. Patton (1990) calls these three types respectively the standardized open-ended interview, the informal conversational interview, and the general interview guide approach, and Kane (1991) names them respectively the standardised schedule interview, the unstructured interview, and the standardised interview (no schedule).

2.5.2.1 The Structured Interview

This is the type of interview where typically each person is asked essentially the same questions in the same order. The questions are generally written out in advance in exactly the way they are to be put during the interview, and in effect, as noted by Kane (1991) they form a type of questionnaire. Probing may be permitted, but going off at a tangent or asking supplementary questions suggested by the subjects' responses does not take place. This kind of interview is most suited to a situation where the researcher already knows a considerable amount about the topic being investigated, and therefore knows what questions to put. It is also suited to an investigation where more than one interviewer is being used, and where the desire is to reduce response variation caused by this, since different interviewers may put questions in different ways. A highly structured interview will reduce interviewer effect, but it may suffer from its inflexibility and lack of spontaneity.

2.5.2.2 The Unstructured Interview

In this kind of interview the researcher does not follow a detailed interview guide but rather knows the sort of information that he wishes to elicit and aims to obtain it in a general conversational way, making comments or asking questions in a spontaneous way from time to time to lead the interview in the direction he desires. Various types of interview or exchange may be classified as unstructured, from the casual encounter with someone who happens to be able to throw some light on an aspect of the researcher's area of concern to meeting with individuals or groups whose culture and outlook are so different from that of the investigator that he has no choice, at least initially, but to employ an unstructured approach (Kane, 1991). As Patton (1990) points out, the subjects may in some cases of the unstructured interview not even realise that they are being interviewed.

2.5.2.3 The Semi-Structured Interview

Of the semi-structured interview Borg (1981) writes:

> Most interviews in educational research are semistructured. The interviewer follows a guide that covers all essential information needed by the researcher. However, he also has the option to follow up any answers in an effort to get more information or clarify the respondent's replies. (p. 88)

In interviews of the semi-structured type one of the underlying assumptions is that, while the ground to be covered may be firmly set in the interviewer's mind, it may be covered with any one particular respondent or group of respondents in a different order from that which is used with others, or if the respondent is allowed to go off at a tangent in supplying useful information before being guided back to the next question. In some instances of this type of interview it may be useful to outline the issues to be examined with the subject before the interview proper begins (Patton, 1990).

One disadvantage of this type of interview over a more structured approach is that, while responses obtained may cover a great deal of material and allow for group variation, they may not be so readily quantified or categorised, and they may not therefore be so susceptible to codified analysis, if that is the analysis method of choice.

The advantages of the semi-structured interview, however, for qualitative research have made it the choice of the researcher in this current study. It should be borne in mind, however, that any one individual interview in this type of research may happen to tend towards the 'structured' or the 'unstructured' end of the spectrum.

2.6 Sampling

In general terms, sampling is the selection of a number to be investigated from a total population in the belief that those selected are representative of the total and that what is discovered about the selected number will allow inferences to be made about the total (Barhamain, 1997; Cohen and Manion, 1994; Ragin, 1994), although Patton (1990) enters a caution about what he asserts are the different logics of different sampling techniques (See 2.6.2 below).

Writing about sampling, Adams and Schvaneveldt (1991) state:

> If the sample is inappropriate it is a sure conclusion that the research is flawed. Elaborate statistical analysis, detailed reviews of literature, and beautiful prose do not do away with problems of flaws in the sampling part of completing a quality piece of research. (p. 177)

This statement can hardly be contested. Clearly, if the wrong persons are approached then no matter how well designed and implemented the rest of an investigation is, it cannot be dependable. A consideration of sampling techniques is therefore of crucial importance for this study.

Sampling techniques are classified in different ways (and sometimes given different names), but two main techniques can be identified. They are outlined below.

2.6.1 Probability samples

This is also sometimes referred to in lay terms as random sampling. It may be defined thus: a probability sample is 'a sample with each element or group of elements having an equal probability of being included' (Adams and Schvaneveldt, 1991, p. 179).

Probability sampling is subdivided into various types. The scheme outlined below is based on that of Cohen and Manion (1994), but similar delineations may be found in Adams and Schvaneveldt (1991) and Barhamain (1997). Probability sampling includes simple random sampling, in which there are selected at random (such as by drawing from a hat) from the population the required number of subjects. Systematic sampling is a form of random sampling, but in this case, sometimes after the first sample has been selected randomly, then every *n*th unit, say every twentieth, is taken from the population as required. Stratified sampling is similar to systematic sampling, where the population is divided into parts or strata on the basis of certain characteristics, and as such requires that the researcher is already familiar with some characteristics of the population as a whole. Cluster sampling is often used when geographic, economic, or other considerations make it impossible to select on a simple random basis. First some elements, say locations, are selected randomly, and from within those clusters further selection is then made. If that further sampling is itself based on a second stage of random selection it is referred to as stage sampling.

On the whole, probability sampling is better suited to a quantitative research method, where there is potential access to a large population about whom not much may already be known, and where the over-riding consideration is generalisation from the sample to the total population. Its logistics, rather than any theoretical reasons, mean it is not generally appropriate for any in-depth investigation.

2.6.2 Non-Probability Samples

This is sampling where it is not possible to state the probability of a given subject being included in the sample. In other words, the subjects are not selected randomly from within the relevant population. This being so, non-probability sampling is much less likely to yield results or conclusions that hold generally for the population. Indeed, the logic of this type of sampling differs from that of probability sampling, as is pointed out by Patton (1990), in his comparison of quantitative and qualitative research:

> Perhaps nothing better captures the difference between quantitative and qualitative methods than the different logics that undergird sampling approaches. Qualitative inquiry focuses in depth on relatively small samples, even single cases (n = 1), selected *purposefully*. Quantitative methods typically depend on larger samples selected randomly. Not only are the techniques for sampling different, but the very logic of each approach is unique because the purpose of each strategy is different.

> The logic and power of probability sampling depends on selecting a truly random and statistically representative sample that will permit confident generalization from the sample to the larger population. The purpose is generalization.
>
> The logic and power of purposeful sampling lies in selecting *information-rich cases* for study in depth. Information-rich cases are those from which one can learn a great deal about issues of central importance to the purpose of the research, thus the term purposeful sampling. (p. 169)

Non-probability sampling comes in various types. Again the scheme used is that of Cohen and Manion (1994). Convenience sampling is perhaps the commonest type of sampling (Adams and Schvaneveldt, 1991), and it is simply gathering data from anyone who is convenient: friends, neighbours, classmates, or whatever. Quota sampling is the 'non-probability equivalent of stratified sampling' (Cohen and Manion, 1994, p. 89), a point also made by Adams and Schvaneveldt (1991). In this, the researcher is seeking to study a fixed number of subjects with certain characteristics, in the proportions in which they occur in the total relevant population. Dimensional sampling is a particular type of quota sampling in which the investigator distinguishes various factors of concern in the population and attempts to obtain at least one respondent showing every combination of these factors. In purposive (Patton's 'purposeful') sampling, the researcher handpicks the subjects to be sampled on the basis of certain criteria he has established, in the belief that they will be particularly suitable or informative. Snowball sampling, as the name suggests, involves the initial selection of a small number of suitable individuals, who then put the researcher in touch with other suitable individuals, and so on.

It will be clear from the above that non-probability sampling is the more appropriate of the two major sampling techniques, and it has been the one selected for this study. It is more suited to a qualitative research method and to a descriptive approach. The researcher has opted for purposeful (or purposive) sampling, since the area to be researched is one about which he already had some relevant information, and because of comparative ease of access. Selected individuals involved in architectural practice and architectural education in Saudi Arabia have been interviewed during the researcher's field trip.

2.6.3 Sampling Size

The question of the right sample size is a vexed one. Patton (1990) writes:

> There are no rules for sample size in qualitative inquiry. Sample size depends on what you want to know, the purpose of the inquiry, what's at stake, what will be useful, what will have credibility, and what can be done with available time and resources. (p. 184)

The same point is made by Ragin (1994), and Cohen and Manion (1994). There seems to be general agreement that the most appropriate sample size cannot be predetermined, but must depend on what the researcher meets when reaches the field. One criterion that may be suitable is to continue to interview new subjects until what might be called the 'saturation' point is reached. Ragin (1994) describes this situation as follows:

> When many instances of the same thing are studied, researchers may keep adding instances until the investigation reaches the point of **saturation.** The researcher stops learning new things about the case and recently collected evidence appears repetitious or redundant with previously collected evidence. It is impossible to tell beforehand how many instances the researcher will have to examine before the point of saturation is reached. In general, if the researcher learns as much as possible about the subject, he or she will be a good judge of when this point has been reached. (p. 86) (emphasis in the original)

The same point is made by Lincoln and Guba (1985), (who speak of 'redundancy' rather than 'saturation'); they advocate sample selection

> to the point of redundancy . . . In purposeful sampling the size is determined by informational considerations. If the purpose is to maximise information, the sampling is terminated when no new information is forthcoming from new sampled units; thus *redundancy* is the primary criterion. (p. 202) (emphasis in the original)

Care should be taken over this, however, lest it be assumed that the point of saturation has been reached when in fact it has not. If the first two or three subjects interviewed happen to make the same points, this is too small a sample to regard as satisfactory, or to assume that saturation has been reached.

In the long run, with no fixed rules to determine what the sampling size in qualitative research should be, the researcher, in justifying his sample size, can do no more than describe and explain his sampling decisions, to show how they integrate with his other methodological decisions, and appeal to the experience and understanding of his peers and the users of his information for their acceptance. (Patton, 1990)

2.7 Fieldwork Survey

This section describes the preparation and conduct of the researcher's main fieldwork in Saudi Arabia and Egypt from December 1997 to April 1998, during the course of which he collected the data for his analysis. The fieldwork was preceded by a pilot study in January 1997 to explore the research potential of the topic and the ascertain the appropriate method of data collection. In connection with this a pilot questionnaire was developed and tested (See Section 2.5.1). A second field trip was made to Saudi Arabia in December 1998 in order to gather further statistical information.

2.7.1 Preparation and planning of the fieldwork

The researcher's fieldwork in Saudi Arabia took place during the period from 20 December 1997 to 8 April 1998. A timetable for the field trip was prepared for the purpose of optimising the time spent. Table 2.1 shows the progress of the researcher's fieldwork, indicating details about the research activities carried out in the course of it.

The researcher spent one period of two weeks in Egypt to attend the International Conference on Cultural Heritage and Architectural Education. This Conference was organised by Misr International University and the International Union of Architects and was held from 27 to 29 December 1997. In addition to attending the Conference the researcher made use of the two weeks in Egypt to conduct several interviews with practitioners and teachers of architecture. These individuals were:
Ahmed Rashed, Assistant Professor of Architecture, Asyut University.
Fuad A. Faramawi, Professor of Architecture, Ain-Shams University.

Mohammed A. Serag, practitioner and Chairman of the Department of Architecture, Al-Azhar University.

Osamah A. Abdou, Assistant Professor of Architecture, Misr International University.

Mohammed A. Ibraheem, practitioner and Assistant Professor of Architecture, Ain-Shams University.

Salah Z. Said, practitioner, Professor of Architecture, Dean of Misr International University's Faculty of Engineering, and Vice-President of the International Union of Architects.

Sayf-Allah Abo-Al-Naja, The Secretary General of the Egyptian Architectural Committee.

Sayed Ettony, practitioner and Professor of Architecture, Cairo University.

The researcher selected these architecture professionals because they represented a variety of backgrounds within the teaching and practising of architecture and because, in the cases of some, they had personal experience of the architecture situation through teaching in the Kingdom. He also visited several schools of architecture, as well as the Society of Egyptian Architects and the Union of Egyptian Engineers. These interviews and visits were conducted primarily to complement and enhance the comparative lack of material in the literature on architecture in Egypt.

Before the interviews and the visits to various locations in Saudi Arabia took place, some preliminary work involving planning the visits, selecting samples, corresponding with interviewees, and preparing interview questions was undertaken.

Interviewing teachers, students and practitioners of architecture was the chief collection method of data used in this research. However, before embarking on this task, it was important to select a representative sample. The names of some potential interviewees, especially, but not only, amongst architecture teachers, suggested themselves as a result of their having published articles or written dissertations or theses about the architectural situation in Saudi Arabia. In order further to assist the researcher in his sample selection a very simple survey was done consulting and exchanging ideas personally with some persons who, by their experience or position, know most of the schools and practices of architecture in Saudi Arabia, or at least a wide range of them. Amongst those with whom the researcher consulted were Dr. Abdul Hamid Al-Bis and

Dr. Majdi Hariri of the School of Architecture of Umm Al-Qura University in Makkah. These consultations yielded two types of information. Firstly it generated names of possible interviewees, and secondly it made possible the outlining of a set of sampling criteria; the criteria are as indicated below in the sections dealing with the various types of interviewees. Following upon this contact with potential interviewees was initiated in order to arrange appointments with them

Following the preparation period of two weeks the researcher then visited the following cities, which are the locations of the Saudi schools of architecture: Riyadh, Dammam, Dhahran, Jeddah, and Makkah.

JANUARY				FEBRUARY				MARCH			
1	2	3	4	5	6	7	8	9	10	11	13
1-8	9-16	17-24	25-31	1-8	9-16	17-24	25-31	1-8	9-16	17-24	25-31

FIELDWORK PREPARATION	HOLIDAY	RIYADH	DAMMAM	DHAHRAN	JEDDAH:	MAKKAH	HOLIDAY
• Preparing the plan of the visits • Sample selection • Correspondences with schools of architecture and interviewees • Preparation of interview questions	• Ramadan Break	**Visits**	**Visits**	**Visits**	**Visits**	**Visits**	• Hajj Break
		• School of Architecture, King Saud University • Ministry of Housing and Public Works • Municipality of Riyadh • Saudi Omran Society	• School of Architecture, King Faisal University	• School of Architecture, King Fahad University	• School of Architecture, King Abdul-Aziz University • Municipality OF Jeddah	• School of Architecture, Umm Al-Qura University • Municipality of Makkah	
		Documentary Search	**Documentary Search**	**Documentary Search**	**Documentary Search**	**Documentary Search**	
		• King Fahad Library • Library of Ministry of Planning • K. Abdulaziz City for Science and Technology • Library of King Saud University • Photo documentation of a sample of contemporary architecture in Riyadh	• The Library of King Faisal University • Photo Documentation of a sample of contemporary architecture in Dammam	• The Library of King Fahad University • Photo documentation of a sample of contemporary architecture in Khobar	• The Library of King Fahad University • Photo documentation of a sample of contemporary architecture in Jeddah	• The Library of Umm Al-Qura University • Photo documentation of a sample of contemporary architecture in Makkah	
		Interviews	**Interviews**	**Interviews**	**Interviews**	**Interviews**	
		• Teachers of architecture • Final year student • Private practitioners • Government practitioners	• Teachers of architecture • Final year student	• Teachers of architecture • Final Year Student	• Teachers of architecture • Final year Student • Private practitioners • Government practitioners	• Teachers of architecture • Final Year Student • Private Practitioners • Government Practitioners	

Table 2.1: Timetable of the Final Fieldwork Session in Saudi Arabia

2.7.2 *School Survey*

Before the interviews in the schools were conducted, the researcher obtained such relevant documentation about the school as he could, pertaining to its history, size, curriculum, staff numbers, and so on. He visited each school and met with the head of the school, and he familiarised himself as far as possible with its physical setting, its facilities, etc. Where appropriate, he took photographs.

2.7.3 *Interviews*

The interviews fell into two types: individual personal interviews, conducted with architecture teachers, practitioners, and government officials, and group interviews, conducted with students of architecture. A brief account of the background to each group and the criteria for their selection will be provided below.

<u>1. Teachers</u>

Teaching staff in the schools of architecture in Saudi Arabia were an obvious group from which to select samples. They are most acquainted with the structure and history of architectural education in the country, in many instances the length of their careers enables them to comment on changes or trends that have developed in architectural training, and in the case of several they have direct experience of architectural education in other countries, either through having undertaken postgraduate studies there or because they are non-Saudis, to enable them to make comparisons. They have in-depth knowledge of curricula, of their fellow teachers, and of students. Table 2.2 indicates the school, nationality, length of service, and teaching post of the teachers interviewed.

The teachers to be interviewed were selected according to the following criteria:

<u>1. The University</u>

In Saudi Arabia there are seven universities, five of which provide architectural education. The sample of teachers will include some from all the schools of architecture.

2. Nationality of the Teacher

Schools of architecture in Saudi Arabia have both Saudi and non-Saudi teachers for members of staff, and they will form two groups of interviewees.

3. Teaching Experience

Teachers at schools of architecture have been teaching for different lengths of time. While some have long teaching experience others are at the start of their teaching careers. The sample of teachers will include, based on the length of their teaching experience, Assistant Professors, Associate Professors, and full Professors, across the spectrum of architectural subjects.

No.	Name	Nationality	Teaching Experience	Position
I	**King Saud University** **College of Architecture and Planning** ***Department of Architecture and Building Science***			
1.	Bahammam, Ali	Saudi	6 years	Assistant Professor Former Chairman, Dept. of Arch.
2.	Fadan, Yosef	Saudi	15 years	Associate Professor Former Chairman, Dept. of Arch.
3.	Ghamadi, Mohammed	Saudi	5 years	Assistant Professor
4.	Sulaiman, Tariq	Saudi	16 years	Associate Professor
5..	Haikal, Namir	Egyptian	25+ years	Professor
V	**King Faisal University** **College of Architecture and Planning** ***Department of Architecture***			
6.	Akbar, Jameel	Saudi	14 years	Associate Professor Chairman Dept, of Arch.
7.	Hilton, Keith	British	20+ years	Professor
8.	Lyali, Sameer	Saudi	8 years	Assistant Professor Vice-Dean, College of Arch.
9.	Sa'ati, Abdul-Aziz	Saudi	12 years	Associate Professor Former Dean, College of Arch.
10.	Ustankok, Okan	Turkish	15 years	Associate Professor
III	**King Abdul-Aziz University** **School of Environmental Design** ***Department of Architecture***			
11.	Mufti, Farooq	Saudi	17 years	Associate Professor Former Chairman, Dept. of Arch.
12.	Tarim, Jahed	Saudi	6 years	Assistant Professor Chairman, Dept. of Arch.
13.	Mohammed-Ali, Zaini	Saudi	5 years	Assistant Professor Vice-Dean, College of Arch.
IV	**King Fahad University of Petroleum and Minerals** **College of Environmental Design** ***Department of Architecture***			
14.	Ishteeaque, Ellahi	Pakistani	20+ years	Associate Professor
15.	Rageeb, Tamer	Saudi	2 years	Assistant Professor Chairman, Dept. of Arch.
16.	Siddiqi, Anis	Pakistani	20+ years	Associate Professor
II	**Umm Al-Qura University** **College of Engineering and Islamic Architecture** ***Department of Islamic Architecture***			
17.	Hariri, Majdi	Saudi	12 years	Associate Professor
18.	Abdul-Baghi, Mustafa	Sudanese	20+ years	Assistant Professor Former Chairman, Dept. of Arch.
19.	Barhamain, Sami	Saudi	10 years	Assistant Professor
20.	Saleh, Hussain	Egyptian	25+ years	Professor

Table 2.2: Profile of Teachers Interviewed

2. Practitioners

Architecture practitioners formed an obvious group from which to select samples. They have undergone architectural education themselves, and they are the people to whom new graduates go to work or to whom students go to undertake their period of summer training. They have first-hand experience of the capabilities of these students and graduates, and seemed likely to have clear and distinct opinions about their readiness to work as architects. Table 2.3 indicates the nature of the practice, length of service, and position of the practitioners interviewed.

The practitioners to be interviewed were selected according to the following criteria:

1. Nature of Practice

Generally, practitioners of architecture in Saudi Arabia work either in government offices or private ones. The sample will include architects working in both sectors.

2. Length of Practice

Architects have different work experience. While some of them have long work experience, others are just new graduates. The sample includes architects with long experience who also employ new graduates. This will enable them to comment on the new graduates' fitness for practice. For balance the sample should also include architects who have been in professional practice for a shorter period, which will enable them to reflect on their experiences as new practitioners as well as their training.

3. Size of Practice

The size of private architectural offices in Saudi Arabia ranges from small practices to large firms. The sample of architects will include architects working in large architecture firms as well as small-to-medium ones.

No.	Name	Nature of Practice	Length of Experience	Practice
1.	Aba-Al-Khail, Ibrahim	Private	26 years	Aba-Al-Khail Consultants Editor and Owner, *Albena*
2.	Ashi, Thamer	Private	2 years	Zuhair Fayez Partnership Consultants Architect
3.	Attas, Hashim	Government	23 years	Municipality of Makkah Director General of Project Design
4.	Bagabas, Ahmed	Private	9 years	Vision Design, Supervision, and Construction Company
5.	Fayez, Zuhair	Private	27 years	Zuhair Fayez Partnership Consultants President and Owner
6.	Kamel, Abdul-Aziz	Private	23 years	Urban Development Establishment Director General and Owner
7.	Kamfar, Waheeb	Private	11 years	Kamfar Architectural Design Owner
8.	Kurdi, Nizar	Government	4 years	Ministry of Housing and Public Works, Architect
9.	Masoud, Arif	Private	21 years	Zuhair Fayez Partnership Consultants Director of Design
10.	Nwaeser, Ibrahim	Government	10 years	Ministry of Housing and Public Works, Architect
11.	Qurashi, Abdullah	Private	14 years	Zuhair Fayez Partnership Consultants Project Manager
12.	Rifai, Mohammed	Private	14 years	The Consultants Group Assistant Director General
13.	Sedairi, Badr	Government	17 years	Ministry of Housing and Public Works Director General of Design Dep.
14.	Shoabi, Ali	Private	28 years	Al- Beeah Partnership Director General and Partner

Table 2.3: Profile of Practitioners Interviewed

3. Students

Clearly, students had to be interviewed. They are the current recipients of architectural education in Saudi Arabia, and the experience of teaching, curricula, academic resources, and summer training would be fresh in their minds. It also seemed useful to have the perspectives of those who, but for their summer training period, had not yet set out on their working careers.

Students were to be interviewed in groups. There were various reasons for this. For one thing, students are many in number, at least compared with teachers. Furthermore, being young they would be inclined to lack confidence and might be hesitant to criticise systems or authorities if interviewed in an isolated situation. With colleagues, they would be more forthcoming, and more willing to state firm opinions once one of their number had done so. Table 2.4 indicates the school, year of study, and GPA of students interviewed.

The students to be interviewed were selected according to the following criteria:

1. The University

Of Saudi Arabia's seven universities five provide architectural training. In the light of this criterion, students will be chosen from all five schools of architecture.

2. Experience of Practical Training

Students of architecture in Saudi Arabia are required to complete a four-week summer practical training period in an architectural office before graduation. It was suggested that only students with office training be interviewed. The reason for this is twofold. Firstly, the student would have had an exposure to the world of practice, which will help him to be aware of the issues addressed during the interviews. Secondly, the student upon finishing his practical training would have passed through the whole course of study, which will enable him to comment on it.

3. GPA of the Student

Students of architecture complete their degree with different achievement levels. Based on the university GPA scale, some students achieve a GPA from 4.0 to 5.0 (excellent), others from 3.0 to 3.99 (very good), and the others from 2.0 to 2.99 (good).

No.	Name	Year	GPA
I	**King Saud University** **College of Architecture and Planning** ***Department of Architecture and Building Science***		
1.	Assaf, Fahad	Final Year	3.4
2.	Faris, Anas	Final Year	3.8
3.	Gadair, Iead	Final Year	3.64
4.	Ghanim, Mohammed	Final Year	2.2
5.	Jamaz, Khalid	Final Year	3.75
6.	Musharif, Aiman	Final Year	4.1
7.	Zimindar, Abdul-Aziz	Final Year	2.4
V	**King Faisal University** **College of Architecture and Planning** ***Department of Architecture***		
8.	Ajmi, Abdullah	Final Year	2.8
9.	Atiah, Amar	Final Year	3.8
10.	Kazim, Hani	Final Year	2.37
11.	Zinaigeer, Badran	Final Year	3.9
III	**King Abdul-Aziz University** **School of Environmental Design** ***Department of Architecture***		
12.	Abu-Al-Khair, Hatim	Final Year	3.7
13.	Bugdadi, Waheeb	Final Year	3.1
14.	Gazawi, Riam	Final Year	2.8
15.	Hilmi, A'asim	Final Year	3.8
16.	Johani, Faisal	Final Year	3.5
17.	Kutbi, Iead	Final Year	3.95
IV	**King Fahad University of Petroleum and Minerals** **College of Environmental Design** ***Department of Architecture***		
18.	Hindi, Firas	Final Year	3.9
19.	Jaroof, Abdul-Majeed	Final Year	2.8
20.	Kayali, Issam	Final Year	3.8
21.	Madkhali, Khalid	Final Year	4.1
22.	Niazi, Abdul-Kareem	Fourth Year	4.0
23.	Shrbini, Khalid	Final Year	3.6
24.	Zain-Al-Deen, Sami	Final Year	3.8
II	**Umm Al-Qura University** **College of Engineering and Islamic Architecture** ***Department of Islamic Architecture***		
25.	Amri, Husain	Final Year	2.9
26.	Bin-Mahfoz, Mohammed	Final Year	4.25
27.	Hashimi, Omar	Final Year	3.1
28.	Khaiat, Mohammed	Final Year	3.3
29.	Najar, Abdullah	Final Year	3.6
30.	Nawawi, Midhat	Final Year	3.5
31.	Zaidi, Othman	Final Year	3.0

Table 2.4: Profile of Students Interviewed

2.8 The Interview Procedure

Interviews with teachers and practitioners were conducted in their offices, either in the school or in their practices. Group interviews with students took place in classrooms in the architecture schools.

The interviews were recorded on tape, as there is no really satisfactory alternative way of making sure that nothing said is missed. As Patton (1990) notes:

> No matter what style of interviewing is used, and no matter how carefully one words interview questions, it all comes to naught if the interviewer fails to capture the actual words of the person being interviewed. The raw data of interviews are the actual quotations spoken by the interviewees. There is no substitute for these data. (p. 347)

Tape recording also allows the researcher to give more attention to the respondent, which would not be possible if every word had to be written down. It is very helpful to an interviewer to be able to respond to cues from and to give cues to his interviewee, and the interactive nature of interviewing can be compromised if the researcher is not free of the need to note everything down (Patton, 1990).

Notwithstanding the great advantage of tape recording interviews, this does not eliminate the need to take notes altogether. Notes can be useful at the data analysis stage, enabling the researcher to locate readily significant passages in the tapes, and they can also serve as an on-the-spot prompt to the interviewer, reminding him of what has been said at an earlier stage. Notes can also encourage the respondent, giving him an indication, in addition to the verbal and physical responses of the interviewer, that what he says is significant. It goes without saying that the location of the interview and the quality, positioning, and operating of the tape recorder should all be handled with the greatest care to ensure that no data is threatened by background noise, low batteries, accidental tape wiping, and so on.

2.9 Framework for Data Analysis

This section describes the interview transcriptions and computer analysis that were utilised as a framework for the breakdown of the data collected during the researcher's field trip.

2.9.1 Interview Transcription

Following the tape-recording of the interviews they were transcribed as soon as it was practical to do so. Those which were in Arabic - the great majority - were translated into English upon the researcher's return to the United Kingdom. The text of the translation was then compared with both the original recordings and the original transcript by five persons fluent in both Arabic and English, and checked for errors and inaccuracies. Any agreed errors or inaccuracies were then corrected in the text. The full text of the interviews conducted is provided in Appendices I, II, and III.

2.9.2 Computer Data Analysis

> The purpose of qualitative inquiry is to produce findings.. The process of data collection is not an end in itself. The culminating activities of qualitative inquiry are analysis, interpretation, and presentation of findings. (Patton, 1990, p. 371)

There is general agreement that analysing the data produced by qualitative research, particularly through interviews, is an elusive process (McCracken, 1988; Patton, 1990; Mason, 1996; Bogdan and Biklen, 1982). The first problem that the researcher encounters is, what is to count as data? Unless the researcher is investigating a field that has never been received any attention before or about which he knows nothing at all, he will be able preliminarily to recognise some relevant data. This will be based on his literature survey, which will have identified areas of concern, and on whatever other knowledge or understanding of the area of investigation that he has gathered through personal experience or interaction with other persons who have something to contribute. McCracken (1988) writes of data analysis:

> The investigator comes to this undertaking with a sense of what the literature says ought to be there, a sense of how the topic at issue is constituted in his or her own experience, and a glancing sense of what took place in the interview itself. The investigator must be prepared to use all of this material as a guide to what exists there, but he or she must also be prepared to ignore all of this material to see what none of it anticipates . . . the investigator must be prepared to glimpse and systematically reconstruct a view of the world that bears no relation to his or her own view or the one evident in the literature. (p. 42)

There are, however, no universal rules for analysing qualitative data. In this area so much depends on the personal skills and qualities of the researcher, and he will have to adapt whatever guidelines he may find to the particular study undertaken (Patton, 1990).

In analysing interview data, the researcher has to decide whether to do what Patton (1990) calls case analysis or cross-case analysis. The first is when a case study is written for each person or group interviewed. The second means 'grouping together answers from different people to common questions or analyzing different perspectives on central issues' (Patton, 1990, p. 376), which is the type of analysis selected as more appropriate to the current study. This is a little easier to do if a standardised structured interview pattern has been followed, but in the case of the more open semi-structured interview the relevant data may have to be gleaned from different places in each interview.

Fortunately the indexing capabilities of modern word processing packages facilitate the identification and analysis of data gathered through semi-structured interviews. Key words, phrases, and concepts may be identified by the researcher on the basis of his previous knowledge, of the information provided by the literature review, of his notes taken during interviews, and of his recollection and reading of the transcripts. Recurring themes and motifs can then be codified and analysed by computer.

For data analysis the researcher used the QSR NUDIST qualitative data analysis package for unstructured data which is available in the computer clusters of the University of Newcastle upon Tyne. QSR NUDIST is a software product designed to assist the process of qualitative data analysis. Its name stands for Non-numerical Unstructured Data Indexing Searching and Theorising. The package creates an environment in which one can create, manage and explore ideas and categories; it allows the user to minimise clerical routine and maximise flexibility, and to discover new ideas and build on them. QSR NUDIST enables the researcher to explore documents, creating categories and coding texts, to manage and explore ideas about the data, and to import and export data with statistical programs, spreadsheets, etc.

A QSR NUDIST project is organised in two interlocking sub-systems linked by search procedures. These are described below.

The Document System contains information about every document entered by the user whether on-line or off-line and, optionally, a memo about it. If the document is on-line, it also contains the text of the document and annotations of it. By exploring and coding documents, the user of the system links them to categories he makes in the Index System.

The Index System is made up of nodes, which are containers for the user's thinking about the project. Nodes store the index categories constructed by the user. Along with each category is stored information such as the title and definition of the category, a memo of ideas about it, and references to the parts of documents coded at the node.

By exploring nodes, and the coding at them, the user can link them to documents. The search procedures permit a search of either document text or coding at nodes, to discover and explore patterns and themes, and construct and test theories.

What must not be forgotten, however, in the case of qualitative research, is that a computer analysis of the data, unless extraordinarily sophisticated, cannot give the whole picture. If for example, sixty percent of respondents mention the inadequacy of summer training as a factor in or a 'cause' of the gap between architectural education and practice in Saudi Arabia, then attention should also be given as to whether they mention this factor prompted or unprompted, whether they see it as one factor amongst many, and so on, and consideration should be given to the weight or importance they attach to it, which is something that is very hard to codify and must to some extent depend on the recollection, notes, and subjective judgment of the researcher.

2.10 Summary

In coming to decisions about his research approach and methodology the researcher had to bear several factors in mind. These factors related primarily to his fieldwork, though of course the literature survey, which helped to set the historical framework for the researcher's fieldwork, has also been part of his methodology.

In the light of what the researcher already knew or understood about the perceived gap between architectural education and practice, in view of the comparative lack of literature on the problem as manifested in Saudi Arabia, and in view of the fact that it was the attitudes, responses, perceptions, and understanding of the subjects that the investigator wished to uncover, a qualitative rather than a quantitative methodology was preferred.

As far as the fieldwork was concerned, a descriptive research approach was considered appropriate, rather than a historical or experimental approach. In dealing with the background and setting the framework for the fieldwork, however, historical methods were used, for example in researching the history of architectural education in various countries.

A survey rather than a case study type of research design was adopted, as the survey is more suited to gathering information about a topic, rather than illustrating any one example of it.

The selected data collection method was that of the interview, though consideration was given to the use of a questionnaire. A questionnaire, however, was felt to lack flexibility and to be more suited to quantitative rather than qualitative research. It was felt that it might sacrifice validity to theoretically greater reliability. A pilot study tended to confirm that the interview method was more appropriate than the questionnaire for the purposes of the present research. A semi-structured type of interview was regarded as superior both to the more rigid framework of the tightly structured interview, and to the looser approach of the completely unstructured interview.

As far as sampling selection was concerned, the researcher was faced with two major substantive categories: probability sampling and non-probability sampling. The choice was made to opt for purposeful non-probability sampling, as more suitable not just to qualitative research in general, but particularly to this current study. Sample size is always difficult to estimate at the outset; the researcher decided to interview suitable subjects until he reached saturation point, that is, until no new information was forthcoming, taking care that no premature judgment that saturation point had been reached was made.

The researcher's fieldwork took place during a trip lasting some three and a half months to Saudi Arabia and Egypt. Preliminary arrangements were made and prior correspondence with potential interviewees took place. Before architecture school interviews began the researcher visited the school, met with key academic personnel, and familiarised himself with the surroundings and facilities.

Personal individual interviews with architecture teachers in Saudi (and Egyptian) schools took place, and with practitioners in Saudi Arabia. Group interviews with students in Saudi schools took place. The selection of individuals was based on a number of criteria designed to maximise the representational quality of the sample.

Interviews were tape recorded and transcribed as soon as convenient afterwards. They were translated, where necessary, into English and the quality of the translation checked against both the original tapes and the transcriptions.

Despite the inherent difficulties in quantifying and thus in analysing data gathered by qualitative research methods, it was decided to carry out a computer analysis. The data yielded by the fieldwork survey was analysed using the QSR NUDIST qualitative analysis package for unstructured data, available at the library of the University of Newcastle upon Tyne.

PART II

Architectural Education and Its Relation to Practice: A General Survey

Chapter 3

History of The Evolution of Architectural Education

3.1 Introduction

An account of the development of architectural training over the centuries is impossible to separate to an extent from accounts of changes in the understanding of the nature of architecture itself and what an architect should be. These shifts in understanding constitute not so much a linear development from a primitive view to a new sophisticated concept of architecture informed by technological and aesthetic developments, but rather form a picture of a pendulum swinging between two extremes: the notion of an architect as a craftsman primarily concerned with the empirical matter of erecting buildings, and the notion of an architect-artist primarily concerned with matter of design and style rather than the day-to-day construction of buildings. Tied up with this is the question whether an architect, in order to do his job properly, should be a man of all-round educational accomplishment and intellectual standing. Crinson and Lubbock (1994) explain:

> The history of architectural education is in large part the history of the profession. Debates over the content of the curriculum were debates over what the leaders of the profession believed that architects should be and how their functions differed from those of other professions. (p. 2)

This chapter will examine architectural education as it has been carried out over the years and in various societies. Our main concerns will be thematic rather than chronological, with an emphasis on the nature of architectural practice, on the position of the architect (or his equivalent) in society, and the relationship of changes in the position and standing of architects to the methods of their training. Our treatment will nevertheless of necessity be diachronic, surveying the historical progress of architectural education in order to illuminate our thematic interests.

We will look at the training of architects in relation to the main training systems evolved over the years – apprenticeship and pupillage, the art academy, the polytechnic, the Bauhaus, and the modern university. We will examine the techniques, influence, successes, strengths, and weaknesses of these systems, and the philosophies, open or implicit, behind their methods. We will attempt to explain how and in response to what changes the various developments in the training of architects have taken place, for it has been argued that, by and large, changes in the training systems of architects over the years have been responses to various threats and challenges felt by architects to be posed by changes in society and attitudes around them. Crinson and Lubbock (1994) write:

> The history of the way that the profession has organised the education and induction of its future members is in large part the study of how architects have tried to protect their function. . . . Their system of professional education and qualification has changed as they have adjusted their professional identity in an effort to strengthen it or to protect their position. (p. 2)

And further:

> If the seventeenth and eighteenth centuries can be characterised by the variety of routes of entry into architecture, the later period can be seen as one of successive arguments and debates leading to the eventual triumph of a professional vision of the architect that was both narrowly focused and extraordinarily powerful. At every attempt to define and defend this notion of the architect, resistance to it and alternative visions can be found. *Architectural training and its associated institutions was the most common area of struggle*, but the issue of professionalism also relates to broader changes in the construction industry and the planning of cities and towns. (p. 38) (Researcher's italics).

3.2 Apprenticeship and Pupillage

Sources on the earliest history of architectural education and training are few, as is pointed out by Hassid (1967):

> Early accounts on architectural education are vague. History has reported mainly on architects' works, sometimes on their lives, but very scantily on the process of their education. Architects are usually depicted as being part of the select circle of priests or courtesans sharing the knowledge that was the privilege of the few. (p. 11)

It has been plausibly, if speculatively, argued that the earliest learning must have involved trial-and-error problem solving. Gelernter (1995) writes:

> An early shelter builder possibly piled rocks together, and when they collapsed he may have experimented with a roof of broken tree branches, until eventually he created a successful shelter. While struggling with the problem, he repeated those forms which worked, and avoided those which repeatedly failed. By this simple mechanism he learned at least one way of building a shelter that he could subsequently repeat. (p. 43)

When did the step take place from the primitive shelter builder mentioned above to the earliest architects (or master builders, or designers), in the sense of a group who were or were believed to be in possession of special design knowledge? Early identifications may be found in the 18th century BC laws of Hammurabi of Babylon , which required artisans to teach their crafts to the young. After all, as is pointed out by Gelernter (1995) early individuals lived in communities and would be in contact with others who had faced similar construction problems. He writes:

> By imitating successful forms already existing within their cultural traditions, these individuals were guided to successful solutions without suffering the inevitable failures inherent in the trail and error approach. (p. 43)

He explains further: 'With increasing complexity in the culture adults began to see the need for more explicit directions to the young . . . out of this grew the apprenticeship system.' (p. 43)

At any rate an apprenticeship system, with or without a close family tradition, was a feature of architectural education for centuries to come. Under this system a young man who wished to learn a trade assisted a master who had already become skilled in it. The beginner would work alongside the master and observe him, and then, when he himself attempted the skill the master was carrying out, he would be corrected. It was not necessary, or in many cases even possible, for the master to explain why the way he indicated was the correct way to proceed; it was simply the case that it worked out like that. 'Theory and abstract knowledge' as Gelernter (1995) observes, 'were not important components of this early educational system' (p. 44).

When we turn to another of the first civilisations for which we have any information, that of ancient Egypt, we find further evidence of the development of the apprenticeship system. In the Egypt of the Pharaohs the education of architects, engineers, physicians, and attorneys was tied closely to the priestly class. Jones (1989) points out that privileged architectural information was carefully guarded:

> Knowledge was preserved in the Pharaoh's archives. Papyrus or leather was used to record plans and other pertinent information about the design of temples, methods of healing, and legal statutes. Access to these writings was privileged and permission had to come from the throne. (p. 102)

These trade secrets contained in the royal archives were standards of practice that had been developed largely through family ties, where fathers handed on their secrets to sons (Jones, 1989).

Jones goes on to indicate not only that this was in effect an apprenticeship system, but that it evolved into the development of guilds:

> Later as these skills and knowledge became more pervasive and less guarded, they were transmitted from father to son or to an especially gifted apprentice who became the "adopted son". With or without the sanction of the royalty, orderly education, under a dogmatic structure, emerged as the "apprenticeship system". As this apprenticeship system gradually became more formalised it became identified with the guilds, societies, or orders and was usually guided by a leader of special recognition. (p. 102)

Developments in ancient Egypt may also point the way to an understanding of how, if not exactly when, men began to believe that there was a body of unchanging principles to be discovered, cherished, and handed on in relation to architecture and other disciplines: it was when men began to articulate a belief in divine principles underlying enterprises such as architecture. Indeed in ancient Egypt there were specific deities associated with architecture, the goddess Seshat, known as 'Lady of the builders, of writing, and of the House of Books', Thot, the god of science, and Ptah the god of crafts, described by Kostof (1977) as 'a constellation that neatly scans the total scope of architecture, from pure theory on the one hand to the practical know how of construction on the other' (p. 7).

Kostoff's mention of theory may also help us to identify the beginnings of the education/practice gap which is the concern of this thesis, for the split between the two has also been linked by Gelernter (1995) with split between mind and matter.

It was in Greece from the sixth century BC onwards that ideas about the divinely revealed nature of the principles of design (amongst other cosmological beliefs) began to be challenged. There were many strands to ancient Greek philosophy, but the general trend was away from metaphysical explanations and towards a reliance on the power of the human mind - in fact, on reason. It was then that men began to think not only about *how* something could be the case, but *why*. In other words, they began to think about the principles lying behind events and processes; amongst these matters that they thought about were the underlying principles of design. It was also the ancient Greeks who first attributed natural events to physical causes rather than to divine forces, which eventually led to the rise of natural science and to naturalism in art. The Greeks also placed great importance on the individual human being and his ability to exercise his own understanding of events. This has been characterised as a split between mind and matter. The seeds had, thus, been sown for the later introduction of liberal arts and humanities studies, which dealt with the question '*why*?', for those training to become architects (Gelernter, 1995). There has been identified, then, a duality in Greek thinking, the outcome of which is held by some to be with us today.

Louw (1985) comments on this:

> It would suffice to say that it [intellectual debate on architecture history] has identified the duality set up by the ancient Greek philosophers between mind and world as the root-cause of our present crisis. This, so the argument goes, has led to an artificial separation between the different ways in which Man engages with his environment, namely through the intellect and through the senses. By posing these two "modes of knowing" as alternative and mutually exclusive entities the Greeks set in motion a perpetual conflict between theory and practice which has remained a fundamental characteristic of Western culture ever since. (p. 91)

Although apprenticeship was essentially a simple matter involving little more than the command of physical skills and a mental picture of the forms desired, nevertheless the influence of Greek philosophy meant that a recognition had now been given to the rules of design, and these would have to be learnt by the novice architect.

Whatever the relation of theory to practice, however, the pattern through ancient Greece and Rome, and indeed into the early Christian era, remained that of apprenticeship. Jones (1989) describes it thus:

> The apprenticeship process required total commitment. The master undertook to instruct, house, feed, and clothe the apprentice who repaid his maintenance and his training by a long term of increasingly productive labour. In turn, these apprentices became journey men, who worked for their masters by the day. Eventually, the more skilled apprentices attained mastery of the crafts, became full members of their guild, and maintained employees and apprentices of their own. (p. 104)

It was not until the time of the Romans that there was a description of architecture as a profession, in the writings of Vitruvius (Louw, 1995; Jones, 1989). In his work The Ten Books of Architecture he set out an account of architecture and architectural education in both Greece and Rome. The requirements of architectural education were laid out thus:

> The architectural student should be educated, skilful with a pencil, instructed in geometry, well educated in history, have followed philosophers with attention, understand music, have some knowledge of medicine, know opinions of jurists, and be acquainted with astronomy and know the theory of the heavens. (Book 1, p. 6)

By the time of Vitruvius it seems that there was an awareness of the gap between practice and the knowledge of universal design principles. Vitruvius stated that the knowledge that an architect needed was

> the child of both theory and practice. Practice is the continuous and regular exercise of employment where manual work is done with any necessary material according to the design of a drawing. Theory, on the other hand, is the ability to demonstrate and explain the production of dexterity on the principles of proportion . . . It follows, therefore, that architects who have aimed at acquiring manual skill without scholarship have never been able to reach a position of authority to correspond to their pains, while those who relied only upon theories and scholarship were obviously hunting the shadow, not the substance. But those who have a thorough knowledge of both, like men armed at all points, have the sooner attained their objects and carried authority with them. (Book 1, p. 5)

In Rome, as in Greece, it was expected that architects would be of high social standing, although it appears that Vitruvius was a self-made man of relatively humble origins (Kostof, 1977). As is the case with Greece, there is comparatively little material, apart from the work of Vitruvius, on the education system of architects in the Roman world, though Kostof (1977) identifies three main routes to becoming and architect. These are: training in liberal arts and then with a master, training in the army featuring to a large extent military engineering, and ascent through the imperial civil service. In broad terms all three would seem to have involved the apprenticeship system, though the emphasis on liberal arts and the attitude found in Vitruvius indicate that architecture, for some at least, was regarded as more than a mere trade.

We have little specific information to go on for architectural education during the Dark Ages following the end of the Roman Empire to the end of the first millennium. As is pointed out by Gelernter (1995) the craft guilds of the Roman times went into decline:

> Craft guilds, or *collegia*, flourished in the Roman Empire as and informal and voluntary organizations of workers . . . Authorities in the fourth century transformed some into semi-public organizations with responsibility for supplying essential services and materials. From the fifth to the eleventh centuries they declined and, with the exception of some continued activity in the Byzantine Empire, virtually disappeared. (p. 85)

While Europe was experiencing this so-called 'Dark Ages' period, however, Islamic civilisation and culture was flourishing. As far as architectural training in the early Islamic world was concerned we do not know a great deal. Kostof (1977) speaks of our information about it as a 'slim record' (p. 64). He further states:

> We do not know one hundredth as much about the architect in later Byzantium or in the Muslim countries as we know of the medieval architect in the West. The fault lies, in large measure, with the sources. (p. 62)

Kostof does, however, uncover some information about the training of architects in the Islamic world in medieval times. He writes:

> With few exceptions, architects had little theoretical training. . . On the whole, like his Christian counterpart in Europe, the Muslim architect started out in one or more crafts - masonry, cabinet-making, faience, metalwork, and the like. . . Buildings like the mosque of Sultan Hassan at Cairo or the tomb of Oljeitu in

> Sultaniyah cannot have been achieved without seasoned, albeit entirely empirical, experience in construction. (p. 65)

Writing about Islamic architecture Lewcock (1978) makes a similar point:

> We know very little about the formal training of architects in Islam at any period. . . . It is hard to believe that the great masterpieces of Islamic architecture could have been achieved without the disciplined cultivation of design skills over a long period, together with training in geometry, mathematics, applied mechanics, and drawing. (p. 130)

About family tradition in Islamic architecture, a feature we have already noted elsewhere in former times, Lewcock (1978) writes:

> Other architects were the sons or nephews of established architects, following the traditional Islamic custom of the heredity of occupations. Sometimes the profession of architect existed in a family for some generations. . . In such cases it seems reasonable to assume that training in the art and science of architecture existed for young sons within the family. Indeed architectural training was probably of this apprenticeship type in most periods and places. (p. 130)

Support for the view that a system of apprenticeship, or something similar to it, operated in the Dark Ages in the Islamic world as far as architecture and architectural training was concerned comes from Ateshin (1987):

> Guilds of different crafts in addition to direct links, or even integrated associations with religious institutions of the period, were some aspects of the practice. Either as <u>Asnaf</u> (Craft) Guilds or as <u>Futawwat</u> (Chivalry orders for the youth [sic]) or <u>Ahiyyun</u> (Brotherhoods), they had the structure of a <u>sufi</u> (akin to a mystical) order. The novice entered into the order as an initiate and gave himself up to the 'masters' to be trained in his profession at a very young age. The training itself encompassed the technical knowledge of the art or the craft as well as the social ethics of the discipline. All this was activated within the prescriptive bounds and direction of Islam's own particular world view. The master or the Sheikh at the top was the supreme master/guide not only of the techniques of the craft but also the spiritual well-being of its adherents. Despite its eclipse in the West, this kind of training methodology persisted for some time longer in the Muslim world. (p. 48)

We know that in architecture as in other areas there was a degree of cross-fertilisation between the West and Islamic culture. Kostof (1977) describes some of the points of contact:

> In the first place, conquest delivered some Christian architects into Muslim hands, and the reverse also occurred. . . Secondly, artists and architects sometimes travelled voluntarily from culture to culture. . . Thirdly, images of famous buildings in distant lands, and sometimes their measurements, were brought back by travellers and put to practical use. . .Finally, modes of architectural thinking were transmitted, directly or indirectly, across cultural borders. (pp. 61-62)

As far as architectural education is concerned, however, we can do no more than re-affirm the observation that architects seem to have trained under an apprenticeship system.

The eleventh century saw a revival of city life and economic activity, and by the 13th century a practice similar to the old Roman *collegia* had reappeared in western Europe with the emergence of the craft guilds, which supervised quality and methods of production and regulated conditions of employment for each occupational group in a town. As the bodies which regulated the quality of work produced, these guilds naturally took on the training of the young. The guilds were controlled by the master craftsmen, and the recruit entered after a period of training as an apprentice, commonly lasting seven years. It was a system suited to domestic industry. The master operated on his own premises, where his assistants resided as well as worked, and received free food and clothing. An artificial family relationship was thus often created, with the articles of apprenticeship taking the place of kinship (Gelernter, 1995).

An apprentice architect at this time typically learned a building craft and at the same time was taught the secrets of the trade, including the elements of building design. After his seven years of training the young architect worked for three more years as a journeyman, often travelling through Europe to enhance his experience, before presenting a masterpiece to the guild which, if accepted, qualified him as a master in his own right. He was then in a position to work on his own and take on apprentices himself (Gelernter, 1995). This was the common pattern of training in architecture until the resurgence of learning and achievement that we call the Renaissance began in the fifteenth century.

The apprenticeship system, then, still continued, and indeed flourished in the period of the Middle Ages. Apprenticeship flourished because architecture was now seen as an enterprise that could be fully grasped within the bounds of apprenticeship and did not require liberal arts as a base. Major buildings were sponsored by patrons, often princes or the Christian church, and the architect's part was seen as being of less importance. In fact, as Kostof (1977) points out the very term 'architect' (*architectus*) fell somewhat into disuse in medieval times, and when used it referred to masons and other building craftsmen. It should not be thought, however, that architects faded from the scene in the Middle Ages. As Kostof (1977) goes on to explain:

> The fact is that the term *architectus* fell into disuse precisely because the Classical concept of the architect as it is represented in Vitruvius faded and was replaced by something else: the architect as master-builder. For Vitruvius, the theoretical aspects of the profession and a thorough grounding in the liberal Arts were as important as expert knowledge of building technology. Not so in the case of the medieval architect, who rose from the ranks of the building crafts, carpentry or the working of stone or commonly both, and took part in the actual process of construction alongside the building crew as one of their own. What changed was not fundamental to the traditional task of the architect, the conception and supervision of buildings. The change was rather one of social standing. (pp. 60-61)

Salamah (1995) emphasises the importance of the master builder during the medieval period:

> Master builders were trained as masons and stone cutters who had worked a period of time with an experienced builder. . . Geometry allowed them to design the complex vaulting systems, determine the exact shape of a key stone on the ground, and to cut a series of stones of different sizes, but of the same proportions. The power that geometry gave them to perform complex tasks and the apparent fact of the stability of walls or columns led them to believe that their mathematical knowledge held the key to structural solidity. (p. 18)

In the practice of the master builder, Salamah (1995) further describes the construction process:

> In the Medieval period, the designer did not provide his client with a coordinated set of drawings. Design progressed with the building process itself, in which the plan, the general idea of what was going to be built, was first decided upon; . . then foundations were made, and the building started. (p. 18)

In addition to the craft guilds, which controlled apprenticeship, there first arose in the Middle Ages another type of institution that now shapes architectural education; the university. Universities grew out of the educational system run by the churches in medieval Europe, but they took their organisational structure from the craft guilds and, like the guilds, the first universities understood their function as suppliers of a commodity, in their case scholarship. The career of a student had parallels with the career of an apprentice with a guild, and when a student was ready he underwent examination for a bachelor's qualification - the equivalent of journeyman status in the crafts - and, perhaps later, became a master, the equivalent of a master in the guilds. Gelernter (1995) points out the irony of this in view of the disdain of many modern universities for technical training.

Indeed the apprenticeship/pupillage system in one form or another survived the Renaissance period of the fifteenth and sixteenth centuries and continued to be the main route to the practice of architecture in much of Europe, including Britain, for several hundreds of years. The beginning of the end for the system did not come until the Industrial Revolution, and even then apprenticeship/pupillage proved remarkably resilient for several generations. Writing largely, though not entirely, about the practice of architecture in a British context, Crinson and Lubbock (1994) point out:

> Before the mid-eighteenth century the vast majority of buildings were erected by builders with no pretensions to being designers. Architects, so-called, were only responsible for designing major monuments such as churches and palaces. (p. 2)

There was thus no challenge as far as day-to-day building was concerned to the apprenticeship/pupillage system. The system, however, had its weaknesses, as is indicated by Jones (1989):

> The master rarely had enough time to offer systematized instruction over a period of time, for he was busy or preoccupied with his own work. Other lesser persons, no matter how skilled in their own work, were weak instructors offering little in the way of teaching.

> Rather obviously, this arrangement provided a source of unpaid labor. . . . it was extremely limited in its production of trained personnel and it depended on individual tutoring. (p. 104)

It was in response to these problems that an element of formal group instruction under various trades and crafts and, later, academies began to be introduced. Although this was initially intended to augment the apprenticeship system, the foundation was laid for later patterns of architectural education (Jones, 1989).

Apprenticeship has been associated with pupillage in accounts of the history of architectural education. In general terms modern usage may be said to distinguish little fundamental difference between the terms 'apprenticeship' and 'pupillage'. The two words, however, have an uneasy relationship, and have come to some extent to be used with different applications, relating partially to the difference between trades and professions, 'apprenticeship' being associated with the former and 'pupillage' with the latter, or at least some of them. There is the further consideration that, generally speaking, the pupil paid for his tutoring while the apprentice exchanged his labour for instruction (Crinson and Lubbock, 1994; Nadimi, 1996).

The fact that the two terms mean much the same but are sometimes used to attempt to indicate divergences within traditional training may serve as a pointer to the fact that, in the past, the particular distinction that we make today between trades and professions was not always valid, or at least what we now call a profession might in some cases once have been categorised more as a trade. The situation however, as we shall see, was more complicated than that, and some have seen a clear and substantive distinction between apprenticeship and pupillage, as Crinson and Lubbock (1994) appear to do (though they are far from consistent on this). The nature of this distinction is nevertheless not always made clear. At one point Crinson and Lubbock (1994) state:

> It became common practice for London architects to take on one or more pupils or apprentices. Although they were often used interchangeably, the two categories could be differentiated along the lines that while the pupil paid for his instruction, the apprentice, in the manner of the medieval craftsman, exchanged his labour for his instruction. Consequently the status of the pupil was more like that of an articled clerk, and that of the architectural apprentice like that of an assistant. In practice the type and quality of training

> received probably depended less on differences of status and more on the nature of the architect's office. (p. 24)

This interpretation sees a comparatively small and unimportant distinction between apprenticeship and pupillage. However, Crinson and Lubbock (1994) draw a much greater distinction elsewhere in the same work, listing apprenticeship and pupillage separately amongst the methods of entry to architecture which they identify, and describing them so differently that it is clear that this second interpretation sees a real and more substantive difference between them. Apprenticeship they describe as

> the category of the master craftsman. . . who had a rigorous crafts training, often of seven or eight years, in masonry, building, bricklaying or carpentry and had often acquired design skills empirically. . . In this form of training a body of knowledge was handed down far masters to apprentices. (p. 18)

Of pupillage Crinson and Lubbock (1994) state:

> Pupillage depended on a well-organised office through whose hierarchy and division of labour an aspirant architect could be developed. This form of training increasingly came to dominate. . . Pupillage first became a form of architectural training in the eighteenth century. It is significant that architectural pupillage arose when apprenticeship in general. . . was declining, yet after it had become common for members of the middle classes to put their sons, and occasionally their daughters, through an apprenticeship. . . When pupillage developed as a distinct form of training for architecture, it was thus linked with the particular needs of the middle classes, one of which was to make a clear distinction of responsibility and labour between the architect and other builders. (p. 22)

We shall, therefore, continue to treat apprenticeship/pupillage as essentially the same architectural training method, while noting that, if there *is* a real difference between the two along the lines claimed by Crinson and Lubbock's 'version two' of pupillage, then again it might be seen an instance of a reaction by the profession, perhaps becoming more prestigious and middle class in eighteenth century England, to what it saw as a threat, namely the continued identification of the practice of architecture with the artisan ranks. It is as if the middle classes did not wish to be categorised with the lower orders, and sought a different name if in reality little change in substance to refer to the training methods their sons undertook. Certainly, Crinson and Lubbock insist that the emergence of pupillage was to some extent deliberate and 'fashioned in order to promote a coherent professional identity' (1994, p. 24).

An apprentice/pupil by the late eighteenth century would train for some five or six years and his instruction would include draughtsmanship and office practice. It might also include attendance at evening lectures if he were within reach of the Royal Academy and he might eventually travel abroad to extend his experience of classical architecture (Crinson and Lubbock, 1994).

An anonymous pamphlet of the year 1773 gives an account of the pupillage of an architect. Crinson and Lubbock (1994) write:

> Here the prospective architect is from a middle-class family and has good general education until the age of fifteen. He is then articled to an architect. In his first year or two he learns to measure and improves his drawing. Then he is taught to design and to draw plans, sections and elevations; he is instructed in mechanics, hydraulics and perspective, improves his French and finally travels abroad. . . When he returns home he is well prepared in the studiousness and probity required to become an architect. (pp. 24-25)

This is indeed some distance from the medieval craftsman's apprentice, and begins to approach Vitruvius's idea of the architect as a cultured well-rounded individual with a sound education in the humanities. Fundamentally, however, the training method is that of the apprenticeship, with the young pupil or apprentice essentially receiving his education from an established master rather than at a school of architecture of whatever sort.

The apprenticeship or pupillage system was, nevertheless, particularly a feature of the United Kingdom. Pupillage has been described as 'British and successful' (Gradidge, 1990, p. 78), and until well into the twentieth century it was the general route to becoming a working architect in the United Kingdom. It is a system still used by professions like solicitors and chartered accountants (though these professions too, like that of the modern architect, involve college or university education).

As we shall see when we deal with architecture and architectural education in the UK (Chapter 4), however, pupillage was not the *only* route to architectural success in Britain. Indeed in Britain in the period from the sixteenth century to the early nineteenth century most substantial buildings were commissioned by the ruling classes or by wealthy institutions. The persons to whom such clients turned when they wanted buildings designed were people whom they could trust and admire, and who were themselves scholars and gentlemen (Burston, 1995). Nevertheless, while it must be noted some of the great names of architecture in Britain in pupillage days had come to the profession through another route, the fact still remains that pupillage was the most available *systematic* course open for a young man setting out with the aim of learning to design buildings.

3.3 The Art Academy

Although it was in France that the art academy was seen in its fullest realisation, its origins go back to Renaissance Italy. We have seen that, by the end of medieval times, the status of the architect was that of a craftsman, and although there were craft guilds training young men in various aspects of building design and construction, there were no bodies with the clear and explicit main aim of protecting the profession or regulating its training. Ettlinger (1977) puts it thus:

> Practice of architecture, as we understand it today, was not yet a recognized profession, and unlike the painter or sculptor, the designer of buildings did not have his clearly defined place within the trades. There was no training standard for those wishing to engage in architecture, there was no guild devoted specifically to the professional interests of architects or to supervising their education, and the men who made the plans for churches or palaces were now ranked with humble artisans, not with scholars putting their knowledge to practical purposes.

This was to change, and the impetus for the change first took place in fifteenth century Italy. The revival of art and literature under the influence of classical models that we call the Renaissance led naturally to the adoption of the vocabulary, and so the concepts, of classical antiquity. There was also the discovery in 1415 of a manuscript of Vitruvius's work on architecture in a Swiss monastery. Vitruvius, as we have seen, held the view that an architect had to be a master of both theory and practice. Vitruvius's concept of the architect is a good example of what has come to be called 'Renaissance Man', and his ideas coincided with the new spirit of the age. Leone Alberti (1404-1472) in writing about architecture echoed Vitruvius when he stated that an architect had to have an understanding of 'the noblest and most curious sciences'. For him the architect was an artist and an intellectual who had little in common with the craftsman.

Wilkinson (1977) writes:

> Alberti had a clear idea of architecture as a vocation for gentlemen with a liberal education and a special knowledge of mathematics and geometry; but his view of architecture as a profession was indistinct. . . He had nothing to say about the training of an architect or about building practice except in the vaguest terms. (p. 124)

Jones (1989) stresses that Alberti was one of the first to see architecture as separate from trades or crafts. He states:

> In this regard he [Alberti] followed the method of Vitruvius, and he set out to establish a theory of art for his own time, whose first principle was the separation of the fine arts - painting, sculpture, and architecture, from the useful or mechanical arts such as carpentry or masonry. (p. 105)

This separation between the fine arts and the useful arts had implications for architectural education; rather than learn the skills of building, the potential architect was expected to master theory. The architect, on this view, was not an artisan but a scholar who expressed his ideas in design. Alberti's theories may be seen as lying behind the later establishment of the French academies.

The importance of Alberti in this development is highlighted by Louw (1985), who regards him as the main figure in the replacement in Europe of the craftsman's guild by the art academy, based in the differentiation between design and practice in architecture. Louw indicates that Alberti based his views on the distinction in classical philosophy between mind and matter, design being the equivalent of mind and construction the equivalent of matter. Louw writes:

> On the strength of design (disegno) having essentially to do with mathematics and other philosophical matters, and being independent from the more mundane crafts of the building site, Alberti could now claim that architecture was in fact a liberal art

> and its chief exponent, the artist-architect, worthy of fraternising with the highest levels of society. (p. 93)

He adds:

> The new conception of the architect as a designer and scholar rather than craftsman clearly demanded an entirely new educational system as well. The design academy was the logical outcome. (p. 93)

However, it was not for another century that the idea of architects as an association of self-regulating professionals showed signs of gathering real strength. The Frenchman Philibert Delorme (1510-1570) pictured a body of architecture specialists with agreed training standards and stated areas of responsibility. The architect would be a man of standing sponsored by a patron and quite distinct from the craftsman builder. Wilkinson (1977) states:

> In separating himself from the mason and the carpenter, Philibert was making a social distinction. The architect was striving to present himself as the practitioner of a Liberal Art. This effort was relatively new in France but was well established in Italy, where the emergence of the architect in the Renaissance parallels the rise of the painter and the sculptor to the status of intellectual. (p. 125)

The new style of architect with his patron and his self-awareness as an intellectual and an artist meant a new relationship with the building craftsmen, as a gap had opened between the two, the newness of which may fail immediately to strike the modern observer as it is the prevailing conception today, but which was a striking innovation in sixteenth century France, where the system of apprenticeship at least in building crafts had been less touched by Renaissance ideas than in Italy, and where the differentiation between designer and builder was harder to establish. It was perhaps this new distinction that Delorme was seeking to consolidate when he envisaged a body of professionals regulating their work and education (Wilkinson, 1977).

It was yet another century before the centre of artistic influence moved from Italy to France, where it became more closely associated with the French interest in rational order (Gelernter, 1995). It was in France that the idea of architecture as an expression of classical values led to the royal academies, and in particular to the most influential of them, the Ecole des Beaux Arts.

The origin of the Ecole des Beaux Arts can be traced back to the year 1671, with the foundation in France of the Royal Academy of Architecture, from which developed in 1717 the Academy School. Salamah (1995) writes thus of its origin:

> The Ecole des Beaux Arts emerged from the system of government which sponsored the academic institutions established in France at the turn of the seventeenth century. The Ecole purported an agenda for the architect which was unique at the time: the architect was to be the master designer and the master renderer who specified buildings abstractly on paper. This was consistent with the educational theory of the times: establishing an educational program as opposed to a vocational training program. This worked out well due to the limitations imposed by building technology and government regulations of the times. (p. 41)

Students in the school were by and large cultured and well-educated, enjoying a high social position. Their education was theoretical rather than practical. It was craftsmen architects, who were trained through the apprenticeship system, as they had always been, who did most of the actual building work. It should not be forgotten, in fact, that in France as in Europe generally the apprenticeship system was still the chief system for the training of architects, and the academies were never intended to replace the apprenticeship system entirely (Gelernter, 1995). Their aim was rather to teach the universal basics of art and architecture to students who were already pupils at studios not attached to the academies. Students attended lectures and learned various mathematical and construction principles and the skills of draughtsmanship, and these they applied in the studios to which they were apprenticed. Rosenfeld (1977) writes of the Academy:

> When the academy met for the first time in 1672, the main topic of discussion was a definition of beauty in architecture. For the first time since the Middle Ages, the methods of architectural training were completely changed. In the academy the architect learned, first, abstract principles of design. Only later . . . did he gain practical experience. On the other hand, in the Parisian workshops from the Middle Ages to the seventeenth century, the architect had learned principles of design and structure through direct practical experience. The architects studied the Roman Orders, works of famous architects of the past and present, the royal buildings, and architectural treatises. (p. 177)

Rosenfeld (1977) also points out the enduring nature of the type of architectural training developed in the Royal Academy:

> The methods of instruction developed by the Royal Academy influenced the way architecture was taught all over Europe in the eighteenth and nineteenth centuries. It was only in the twentieth century, when the Bauhaus was founded in Germany, that this system was finally challenged. (p. 178)

This claim is perhaps a little over-stated. The Ecole Polytechnique in France itself dealt with architectural training in quite a different way (See Section 3.4).

It is important to note that the French academies were schools of art as well as architecture, for it was believed that the same universal principles of form based on classical fundamentals applied to both these disciplines, inasmuch as any distinction was made between them. To the academies architecture was regarded as essentially a fine art in which the principles of form stemming from the classical tradition are of the primary importance (Egbert, 1980). Gelernter (1995) describes this belief in the objectivity of principles of form in this way:

> The academies were founded in the age of Mannerism, when the belief in design as an objective, rule-based activity strengthened; they were firmly institutionalized in the Baroque when the preoccupation with rule and rational order reached its height; and then in the Rococo phase of the baroque, when the subjective tendency overtook the objective one in the minds of the artists, the academies lost their vigor. (p. 176)

However much Gelernter may be right about the loss of some vigour, it did not disappear completely, for the best-known and the most influential of the academies, the Ecole des Beaux Arts, Paris, came into being as such in the year 1819, with the coming together of the successors to the Royal School of Architecture and the Royal School of Painting and Sculpture. The Beaux Arts proved able, over the years, to resist the weakening of the classical emphasis that arose under the influence of the Romantic movement and the Industrial Revolution. The very name 'Beaux Arts' means 'fine arts', and this is a reminder that architecture was seen as one of the arts.

We have seen that the *atelier* (studio) system of instruction, where students were tutored in the studio by practising architects, had existed before the founding of the Beaux Arts, but it was this system that became characteristic of it. Cunningham (1993) lists seven strands as the 'methodological characteristics of the Beaux Arts:

1. Division of students into *ateliers* run by a patron.
2. Teaching of young pupils (*nouveaux*) by older students (*anciens*).
3. Teaching of design by practising architects.
4. The design exercise as the core of the educational programme.
5. The beginning of design studies immediately upon entering an *atelier*.
6. Systematic resolution of design problems starting with the *esquisse*:
7. Development of a competitive spirit as a pedagogical tool.' (p. 66)

Salamah (1995) identifies three basic steps in the completion of a Beaux Arts architectural training. The first of these was actually joining an *atelier*, which could be the result of specific choice, say by a candidate aiming for the 'Grand Prix de Rome', or a candidate seeking particular personal attention. The second step was preparation for the entrance competition. Students had to deal successfully with several architectural problems, including design, draughtsmanship, and scientific tests, before enrolling in the school. The third step was going successfully through a series of projects (See below) making the student eligible for the submission of his final thesis.

Design was the heart of the Beaux Arts curriculum, though lectures were given on various other architecture subjects, such as the history of architecture, construction, surveying, and so on. The design projects undertaken by the students followed a specific path, starting with the sketch design (*esquisse*) and carrying through to completion. The Beaux Arts course followed a pattern of second class, first class, and grand prix competitions (to be judged by juries, and with prizes carrying considerable prestige), through which rivalry between students was encouraged. Each student in the first and second classes had to enter at least two such competitions every year, under threat of expulsion (Jacques, 1982). Promotion from second to first class depended not only on a student's *atelier* performance, but also on passing examinations on various architecture-related subjects, and the first class concluded with similar tests. Only then was a diploma awarded. The course generally lasted four or five years.

The philosophy of the Beaux Arts was one of aesthetic merit. Designs and work were judged according to logical standards and 'matters of taste were permitted to remain matters of taste' (Suwayeh, 1985, p. 200). There was not the same interest in materials as such or in architecture as part of the stuff of everyday life that characterised the Polytechnic or the Bauhaus (See Section 3.4 and 3.5below).

It has been claimed that the Beaux Arts tradition, dominant for 150 years, was the primary influence on modern western architectural education. Egbert (1980) writes:

> It was, after all, because of the undoubted success which the the school of the Academie Royale and its heir, the Ecole des Beaux Arts, achieved in training architects, that its influence spread far and wide, at one time or another affecting nearly every country of the world. (p. 5)

This may well be so as far as philosophy is concerned. It is *certainly* so as far as direct influence on architectural training in the USA in particular goes. During the late nineteenth century an increasing number of architecture students from the USA sought their professional education, not in an American school, but in the Ecole des Beaux Arts, and made efforts to introduce the Beaux Arts *atelier* instruction system in America. In 1894 a Society of Beaux Arts architects was formed in that country with the aim of setting up an architecture school on the French model, though this was never in fact done. With the influence of the Beaux Arts having been felt in the USA for some time before this, it was not uncommon for schools to have at least one member of the teaching staff who had trained at the Beaux Arts (Suwayeh, 1985; Bunch, 1993; Nadimi, 1996), and many of the prominent buildings constructed in the USA in the late nineteenth and early twentieth century were built by Beaux Arts-influenced architects.

Draper (1977) has this to say about the influence of the Beaux Arts on the USA:

> Many Americans were attracted to the Ecole by its intellectual and theoretical support to design. They yearned for the discipline of Classicism and the scholarly eclecticism of the French. (pp. 212-213)

The Beaux Arts did not have an effect of the same magnitude on architectural education in the UK or in other European countries as it had in the USA. Indeed we may note here that the role of the art academy in the history of architectural education in France might be contrasted with that of the Royal Academy in the UK. The British Royal

Academy played a much smaller part in the development of architectural training. Crinson and Lubbock (1994) state:

> The Royal Academy had neither the facilities nor the motivation to equal the role of its French counterparts, which gave an intense and inclusive instruction designed to train recruits for royal or military service. It cannot be seen as an engine of educational debate, and it was certainly not a national school of design, but within its limited compass it did supplement training received in London offices. (p. 36)

The Ecole des Beaux Arts, which had several satellite architecture schools in the French regions, effectively closed in 1968, the year of student unrest in Europe. Several new schools of architecture with major curriculum changes were set up, and the old system ceased to exist.

Whatever differences of philosophy, teaching method, etc. that the Beaux Arts may have from other architectural training systems, it had the same objectives and responded to the same challenges as other architectural training innovations over the years. Draper (1977) puts it this way:

> The ultimate purpose of the Beaux Arts movement was to raise the status of the profession. Architects wanted to become recognized as experts with specialized knowledge, obtained through long study. They sought to infuse the profession with a theoretical base and to establish ethical principles of conduct. Doctors and lawyers were also seeking to develop formal educational programs and standards of practice in the nineteenth century. But unlike medicine and law, architecture was not considered one of the learned professions; it was a vocation to be picked up on the job. (p. 214)

Much the same could be said about the move of architectural training to the modern universities and the monitoring and controlling functions of today's professional associations across the globe.

Architecture, now that it was perceived as primarily architectural design, could now be studied and practised in the abstract, with drawings and models, in isolation from the environment in which its products – buildings – were constructed. It had moved from its original craft base, the architect was seen as a scholar and designer, and skills had been replaced by knowledge.

3.4 The Polytechnic

Quite another architectural tradition and role model for architectural education was represented in France by the Ecole Polytechnique, which was founded in 1795 under Napoleon Bonaparte. Its origins, however, can be traced back to the foundation of a corps of civil engineers in 1716, the Departement des Ponts et Chaussées. This body was in charge of the construction of bridges and roadways, which had previously been built by architects. Writing on the situation of architecture in France in the period leading up to the foundation of the Ecole Polytechnique, Picon (1988) states:

> Engineers were distinguished from architects in the eighteenth century, and began then to exert a considerable influence upon the design of space. By deploying a network of new institutions, by codifying their knowledge and practice, they developed a system which was to pose an increasingly serious threat to the architects and, indeed, to wrest some of their traditional prerogatives from them. The theoretical renewal of architecture in the revolutionary period may also be said to constitute an attempt to recover lost ground. (p. 2)

This can perhaps be seen as an instance of the phenomenon noted in Section 3.1, where changes in architecture and its training systems may be interpreted at least partly as reactions to perceived threats and challenges.

Egbert (1980) also highlights the threat posed to the architecture profession by the setting up of the Ecole Polytechnique:

> As the first polytechnical school, it took away from architects even more of their former functions than had the Ecole des Ponts-et-Chaussees. At the same time it even more definitely emphasized efficient structure as an end in itself (instead of a means to the end of formal "beauty" exalted by the academic tradition). (p. 47)

In the period leading up to the founding of the Ecole Polytechnique engineers had taken over the role of architects more and more. Egbert (1980) remarks:

> As soon as the Industrial Revolution made large-scale production of iron possible, it was only to be expected that engineers would turn to it because of its greater structural efficiency. . . However, in order to use any of these materials [cast iron and wrought iron]

> efficiently, it was necessary to develop methods applying complicated mathematics and advanced technology to structural design, methods involving a practical and progressive rationalism very different from that of academic architects . . . Engineers therefore increasingly became scientifically trained technologists who took over the functions of architects. (pp. 43-44)

The Ecole Polytechnique will always be associated with the name of Jean-Nicolas-Louis Durand (1760-1834), who was Professor of Architecture there from 1802 to 1833. As is pointed out by Szambien, 1982) Durand has been classified in a number of different ways:

> He has been called a builder, a functionalist, a rationalist, a revolutionary architect, a utilitarian, and architect of the rising bourgeoisie. He has been seen as the last exponent of classical architecture, as the begetter of modern functionalism; he has been set in the decline of the baroque tradition, and in the history of the rise of the engineer. (p. 19)

The kind of rationalism fostered by the Enlightenment had always appealed to him, and he had sympathy for rationalist ideas closer to the world of engineers than that of traditional architects (Egbert, 1980). He sought in his teaching to expound architecture as subordinate to engineering. Picon (1988) writes of Durand:

> The success of his course may be judged by the influence enjoyed by the architect. His teaching was in effect a response to the administration's demand for engineers who were trained in architecture. (p 322)

Durand's Ecole Polytechnique course was divided into three parts, the first covering the elements of building, the second composition in general, and the third the analysis of buildings (Picon, 1988). The emphasis of the Ecole Polytechnique was therefore on the functional and the structural and on a recognition of the increase of industrialisation, and may be contrasted with the Beaux Arts courses with their accent on classical form. As is pointed out by Louw (1995), the Ecole Polytechnique 'thus became a focus for progressive forces in architectural education and an alternative to the academic tradition throughout Europe' (p. 5).

Durand did not, however, abandon all attempts to harmonise his doctrines with classicism. Gelernter (1995) explains:

> Rather than think about Classicism as specific stylistic elements, like the Five Orders, or as specific compositional rules which create one particular version of the language, he suggested that Classicism should be considered more abstractly, as general concepts which lie behind all good style. . . Good architecture, Durand suggested, satisfied two essential requirements: convenience and economy. Economy he described as achieving the greatest possible effect for the least amount of financial outlay. Convenience he described by referring to Vitruvius' three qualities of durability, convenience and beauty. . . A building will become beautiful only if the architect attends strictly to economy, construction, commodity and healthful conditions. (p. 187)

To Durand, classicism, in the sense of its Five Orders, had come to hold sway only because it was seen as a necessity through force of habit. For him, imitation of classical forms, which was therefore the chief justification for following them, had to be given up in thinking about architecture. Rykwert, 1982) writes:

> The method by which thinking and teaching is to proceed is that architecture must be analyzed down to its simplest components, which are of three kinds. The first is based on the nature of the materials, the second on the past, that is, on the force of habit. Both of these are approximate. To them a third is to be preferred, since it is easier to understand and therefore most economical, and this is the repertory of elementary geometrical forms – of which the circle and the sphere must have our absolute preference.
>
> These forms we may then compose in various ways according to a particular method. It is a method from which there is no appeal. Nor is it a method which can be improved, tinkered with, or discussed. The steps are so tightly argued, the postulates so explicit, that it is only if we are prepared to question them that the whole system begins to shake. (p. 16)

The training given in the Ecole Polytechnique was aimed originally principally at architects working in the military - indeed students were dressed in military uniform (Rykwert, 1982) - and the objective was to produce a certain type of architect-engineer who could design and build based on manuals of architecture. Its teaching was more of a vocational training than a liberal education, and it has been claimed that 'Durand's aim was to teach the basic vocabulary of architecture, nothing more' (Rykwert, 1982).

3.5 The Bauhaus

Another model for architectural training which had an influence and a prestige beyond its country of origin was the German Bauhaus, in existence from 1919 to 1933. It was based in Weimar until 1925, Dessau until 1932, and Berlin in its final months. The Bauhaus was founded by the architect Walter Gropius (1883-1969), who combined two schools, the Weimar Academy of Arts and the Weimar School of Arts and Crafts, into what he called the Bauhaus, or 'house of building', a name derived by inverting the German word *Hausbau,* 'building of a house'.

The origins of the Bauhaus movement can be traced to some extent to developments following the Industrial Revolution, which, for the first time in history, made the skills of the master craftsman redundant. This meant initially that full control over every aspect of the building now belonged to the architect, so that his prestige now rivalled that of other 'professions'. That education for the profession would in due course become academic was now inevitable. However, what appeared at the beginning to have strengthened the position of the architect in fact led to his loss of control over the building process. For one thing, he could not keep up with the technological changes that were taking place, a difficulty which did not exist in the old days of the relatively stable craft-based building industry. Instead it was the engineer, who did have the technical knowledge, who stepped into his place, and who was now in the forefront of building production. Secondly, as the progressive introduction of the new technology made the skills of the craftsman, upon which the architect had previously relied to give realisation to his design ideas, redundant, the architect lost touch with the building - the object of his creative endeavours. It was the Arts and Crafts movement inspired by Ruskin and Morris in the late nineteenth century that was the first reaction against this state of affairs. However, this initiative to go back to the older craft traditions was doomed as it failed to offer competition to the mass production methods associated with the new technology. The Bauhaus attempted to handle this problem through its commitment to industrial design and to the new techniques and materials. It believed that by engaging leading architects to design directly for industry superior products could be made available on a large scale, and in a new post-Industrial Revolution sense it aimed at the reunification of architecture with its craft base. In this way it sought to close the gap between the architect as a designer and the architect as a builder (Louw, 1985).

In the early years of this century Gropius, the leading figure in the early Bauhaus, along with Le Corbusier and Mies van der Rohe, had been an architectural assistant to Peter Behrens in his *Allgemeine Elektrizitäts-Gesellschaft* (AEG) in Berlin. Gropius was also a member of the *deutscher Werkbund,* which sought to achieve reform in environmental design, especially through the work of architects, craftsmen, and industrialists. This emphasis on design was important. Salamah (1995) states of the Bauhaus:

> It aimed at reinstating the control of the designer over other architectural decisions. . . The architect assembled the power of the design decisions through the understanding of form, materials, construction, economics, and sociology. The Bauhaus worked out well. It established the designer as a supreme commander. (p. 48)

Gropius apparently set out with the deliberate intention of breaking new ground, and his Bauhaus founding Manifesto of April 1919 laid stress on two main ideas, the unity of all arts under architecture, and the re-thinking of the crafts by the artists (Sherman, 1974). From the beginning the Bauhaus emphasised the practical and manual aspects of architecture, and sought to recognise and absorb engineering and technological advances into the realm of the architect, thereby ending the schism between art and technically expert craftsmanship. This interest in materials and technology, and in design as the stuff of life, remained characteristic of the Bauhaus, despite the tendency towards a more theoretical approach in its later years. It was a rational approach to architectural planning and design, which contrasted with the more classical Beaux Arts philosophy. The aim of the Bauhaus was in fact to combine the practices of the art academy with the practices of the Arts and Crafts movement, though the interest was more in machine manufacture than in handcrafted work. The Bauhaus idea was to design for the machine age and for industrialised mass production, and in fact it became one of the goals of the Bauhaus to undertake product development in its own workshops.

Salamah (1995) also highlights the role that Gropius picked out for the Bauhaus and how its new approach to design and manufacture was a perhaps long-overdue fulfilment of a requirement of the time, both in educational and economic terms:

> Until the middle of the nineteenth century, artists and craftsmen continued to learn their trades as though machines had never existed. Painters and sculptors still acquired their skills in the refined and elitist atmosphere of the academies, while craftsmen learned by example within an apprenticeship system. In the meantime, the academies encouraged specialization in the belief that the fine arts were different from, and superior to, the crafts. In this period, there were practical reasons why reform was urgent. Governments had become aware that the quality of industrially produced goods crucially depended upon their design. A well-designed product was not only pleasing to the eye; it was also more economical to manufacture. Thus, the modern designer had to understand both why something looked good, and how it was manufactured economically in a given material. (p.49)

The craftsman of tradition may have both conceived and manufactured his goods, but the aim of the Bauhaus was to produce someone who both conceived and planned what would be produced by others by machine.

As far as the day-to-day architectural training programme of the Bauhaus was concerned, the intention of Gropius was to re-establish as fully as he could the training structure of the medieval German craft guilds. Workers in these guilds were not split into those who designed and those who built, but were trained both to design and to build in one ongoing process. Furthermore - and this was typical of the Bauhaus understanding of architecture - the craftsmen found the forms they sought in the nature of the materials they used and the uses to which the artefacts they produced would be put. Gropius sought to re-introduce the master/apprenticeship system with formal academic teaching taking a lesser role, and with masters, apprentices, and journeymen instead of professors and students in the traditional sense.

Naylor (1968) identifies the main components of the Bauhaus training programme (which in fact changed somewhat over the years, some of the traditional handcraft instruction that had featured in the early Bauhaus being dropped after its move to Dessau in 1925). In the early years the Bauhaus programme was divided into three phases: a preliminary course, a general course, and architectural training. Later modifications saw the programme with two main phases: the preliminary course and architectural training. The three semester preliminary course, divided into five classes, had to be passed for the student to move on to the architectural part. Training included instruction in the use of tools and in materials, so that the student could develop an understanding of and feel for materials and their design potential. There were also some factory visits. The preliminary course also covered draughtsmanship and some design theory. Architectural training included three categories of classes: workshop training in metal and wall painting, and aesthetics; training in design constraints such as economic and functional matters; and design studio work with teaching on architectural theory. The Bauhaus programme, therefore, did include some formal instruction in construction, geometry, composition, colours, and so on, as well as the history of art and even elementary biology and sociology (Ateshin, 1987).

The workshops - carpentry, metal, pottery, stained glass, wall painting, weaving, graphics, typography, and stagecraft - were generally led by two people: an artist (called the Form Master), who emphasised theory, and a craftsman, who emphasised techniques and technical processes. After three years of workshop instruction, the student received a journeyman's diploma. Upon final completion of the entire course, which lasted some five years, the student had the title of 'master-builder' conferred on him.[4]

Although Bauhaus members had been involved in architectural work from 1919 (notably the construction in Dessau of administrative, educational, and residential quarters designed by Gropius), the Department of Architecture, central to Gropius's programme in founding this unique school, was not actually established until 1927; Hannes Meyer, a Swiss architect, was appointed chairman. Upon Gropius's resignation the following year, Meyer became director of the Bauhaus until 1930. He was asked to resign because of his left-wing political views, which brought him into conflict with Dessau authorities. Mies van der Rohe became the new director until the Nazi regime forced the school to close in 1933.

The Bauhaus is generally acknowledged to have had far-reaching influence. Its workshop products were widely reproduced, and widespread acceptance of functional unornamented designs for objects of daily use owes much to Bauhaus precept and

[4] For more information on the internal organisation and structure of the programmes and courses of the Bauhaus refer to H. Bayer et al. (eds.), Bauhaus 1919-1928 (1975) and G. Naylor, The Bauhaus (1968).

example. Bauhaus teaching methods and ideals were transmitted throughout the world by teaching staff and students. Today, nearly every art curriculum includes foundation courses in which, on the Bauhaus model, students learn about the fundamental elements of design.

After the school was closed by the Nazi authorities, several of its leading teachers emigrated to America. Among the best known of Bauhaus-inspired educational efforts there was the achievement of Moholy-Nagy, who founded the New Bauhaus (later renamed the Institute of Design) in Chicago in 1937, the same year in which Gropius was appointed chairman of the Harvard School of Architecture. A year later Mies van der Rohe moved to Chicago to head the Department of Architecture at the Illinois Institute of Technology (then known as the Armour Institute), and eventually he designed its new campus.

Without doubt the influence of the Bauhaus has been seminal. Gelernter (1995) writes:

> The Bauhaus, most scholars agree, marks a watershed in twentieth-century architectural history between the early proliferation of competing theories and the later emergence of one dominating paradigm, the International Style. (p. 238)

Gelernter (1995) however, rejects the view held by Gropius himself and others that

> . . . the Bauhaus not only found an objective 'language of vision' that finally rid design of the subjectivism and relativism of the previous century, but also finally developed a modern and progressive alternative to the old art academies. (1995, p. 239)

According to Gelernter (1995) the proponents of the Bauhaus movement in fact appropriated many academic ideas without being aware of their origins. He states:

> Instead of viewing the Bauhaus as a filter that blocked the Expressionist extremes and the decaying Academic tradition, it is more accurate to think of the Bauhaus as a melting pot into which many of the earlier Neoclassical, Romantic and Positivist ideas were blended. Unfortunately . . . the Bauhaus developed not so much a synthesis as an uneasy conflation of these earlier traditions. (1995, p. 239)

3.6 The Modern University

In general terms, in whatever part of the world, architects now receive their education in professional schools. These schools may be independent, like the Architectural Association School of Architecture in the United Kingdom, but commonly they are departments or faculties or other academic divisions within a university or other institute of university rank. Many of those which are now part of a university were formerly independent.

At this stage a word of clarification about nomenclature may be in order. There is a difference between British and American English in the use of the word 'school' in a higher education context. In the USA it is common to use 'school' to refer in a general way to college and university. Thus, depending on the context, the question 'Where did you go to school?' could easily be understood by an American to be a request for information about what university or college he attended. 'Where did you go to school?' in Britain can only be a question about what primary or secondary school was attended. Thus the expressions 'school of law', 'school of medicine', and 'school of architecture' sound a little strange to a British ear, since Britons no longer associate the word 'school' with higher education. Nevertheless the word 'school' is in some cases used in the name of British higher education institutions (e.g. the London School of Economics, the Glasgow School of Art), whether to refer to the entire establishment or to part of a larger establishment. It is thus convenient to appropriate it for a case like 'school of architecture', as this covers all types of architectural education providers, whether independent institutions, university departments, university faculties, or cross-faculty academic associations.

A reminder, too, that the word 'faculty' has different connotations on different sides of the Atlantic might be useful here. In the USA 'faculty' means the teaching staff of a university of college; in Britain it means a major academic division of a university or college considered in all its aspects – teaching staff, students, administrators, buildings, etc.

Reasons why the professional architecture schools in the form of the modern university have now almost exclusively taken over architectural education have been, at least partly, indicated above in this chapter. There was in the UK the Industrial Revolution of the late eighteenth and early nineteenth century, although it was slow to lead eventually to the fading out of pupillage. The old situation had to change with the great increase in industrial development in the country and the rate at which society and technology were transforming. The requirements of building and the methods of construction had become more varied and complicated, such that the technical understanding needed for their command became more than could be supplied by an architect's office. Indeed it was against just such a background that the Architectural Association was founded in London in 1847 to supplement the training provided in pupillage with evening lectures. This challenge to existing architectural training methods is described thus by Ateshin (1987):

> Building types suddenly diversified and challenged the world . . . that was defined from a different age. Not only the new types of building but also advances in building technology, new building materials and implications of these to composition, form and design were part of the problem. (pp. 62-63)

The seeds of training in dedicated architecture schools were thus already planted. Furthermore, we have already noted that in Europe, especially in France with the Beaux Arts and the Ecole Polytechnique, the practice of training architects and engineers in schools rather than exclusively in the workshop of a master had become well established, so that the physical environment and the instruction techniques of the college or university were already familiar ground to many involved in the training of architects, if not the new technologies or the curriculum content or the challenge to accepted norms of design and style.

A further thrust towards the education of architects in universities is noted by Crinson and Lubbock (1994). In writing about the changes at the time of the Industrial Revolution and after they point out: 'The building professions became separated and the surveyors and civil engineers began to define their own training and work more distinctly' (p. 36). This clarification and categorisation of roles and disciplines was yet one more step in making it seem more natural to construct the model of specialisation and in-depth study that is a feature of the university.

The real need to study the new technologies in greater depth was combined with a desire to give architecture a greater intellectual standing. Louw (1995) describes the situation thus:

> The aim was to transform architecture into an academically respectable discipline, with its practice founded on a set of rational operational principles derived from a coherent body of theoretical knowledge. Serious attempts were made to link up with as wide as possible a range of established university disciplines. (p. 8)

Louw (1995) also points out that architecture as an academic discipline, like other academic disciplines, has been at pains to retain its academic autonomy. This is worth emphasising, however much architectural training in most countries has been monitored by professional bodies.

Differences of course exist between various schools of architecture in various parts of the world. These differences are sometimes due to differences in the higher education systems in different countries, and sometimes they are differences in approach, tradition, curriculum, and so on amongst individual institutions. Nevertheless there are some basic features which might be considered regular or typical features and from which we can sketch a picture of 'mainstream' professional schools of architecture.

These features would include those discussed below, though they are not common to all schools of architecture (and indeed there may be no one school where all features are to be found); they may be regarded as constituting a paradigm. Most architecture schools are part of a larger institution, generally a university. Those which are not part of a university are usually considered of university rank. In broad terms, therefore, they require the same level of entry qualification as other university departments or faculties for students intending to follow regular undergraduate courses. As with other disciplines within the institution, any one school of architecture may be to some extent more demanding or less demanding than the institution's departments as a whole, and any one school may be more or less demanding than architecture schools in the country on the whole. These things are often to a certain degree determined by admission policies, by the reputation of the university or the school, by the demand for places, and so on. But in general, entry requirements, as far as academic achievement is concerned, are comparable within an institution and amongst institutions within national boundaries. Indeed, when allowances are made for differences in national systems, they are comparable internationally. The point is that architectural education, as it is now provided by the professional schools, is *academic* training, and evidence of a certain amount of academic ability is required of candidates.

Professional schools offer degree or diploma courses. The shapes and the curricula of these courses, even the names of the degrees and diplomas awarded, vary. But mainstream undergraduate architectural education programmes are typically of up to five years' duration, *not including periods of practical training spent in an architecture office*. In some cases these five or so years are split round the period of practical training. The pattern in some schools is that a student might take a first degree in the humanities or a science subject, and then follow up with a period of architectural training. The name or title of the qualification which a successful student receives varies, but typically, in the English speaking world, it is a Bachelor of Architecture (B.Arch.) degree or a Bachelor or Science (B.Sc.) or Bachelor of Arts (B.A.) in Architecture.

As for curriculum matters, in general those schools, the majority, where a student has no previous degree, insist that the architecture programme should contain some study of humanities subjects (or liberal arts as they are generally called in the USA), in harmony with the understanding of the nature of the architect as a man of all-round education and intellect put forward by the Roman Vitruvius (See in particular Section 3.2).

The curricula of today's professional schools normally try to provide a balance of scientific and aesthetic studies, notwithstanding the earlier differences, particularly in the USA, noted above, between those schools which placed the emphasis on technical aspects and those that stressed artistic element. Perhaps inevitably, however, there has in general developed a concentration on the one field which it is commonly considered makes an architect an architect, and distinguishes his work from that of others involved in construction: building design. The design studio is the centre of the architecture student's studies, and to some extent the quality of a school's course might be judged by how well the other subjects taught relate to it. Architects are also believed to have to know about electrical engineering, construction, geometry, mechanical engineering, surveying, and so on, and they also need to know something about the history of art and architecture. These subjects are indeed taught in the schools of architecture. Within the parameters of national or local variations, therefore, there may be said to be an international core curriculum in architecture studies, based on the primacy of the one thing that distinguishes an architect - design. That is not to say that architecture curricula are set in stone, or that they are always well-designed, or that the subjects are taught in an integrated way. But there does seem to be very broad general agreement about what architecture students need to study in an academic context. This is indeed what one would expect. Many schools of architecture also offer postgraduate training, though this is not, of course, part of the mainstream career path for a potential architect.

There is less agreement amongst schools and amongst national curriculum designers about the extent to which an architecture student needs to be instructed within the school on such matters as professional practice, contracts, budgeting, relating to clients, and so on. Indeed it is the lack of proper preparation in such matters - whether in the school or in periods of practical training - that is a major feature of the gap between architectural education and practice that may be seen under some systems, such at that of Saudi Arabia, the major focus of this present study.

In countries where there is a professional association, there is commonly a considerable input from the association, or a related body, as far as curriculum subjects are concerned. Indeed the national professional body generally accredits the school's curriculum and quality. This is discussed in the case of the United States and the United Kingdom in Chapter 4. Architecture schools, however, have been at pains to maintain academic autonomy and integrity, as we have already remarked.

Depending upon such factors as the school a student attends, the country in which he studies, and/or the course he is taking, an architecture student may find that he is taught only along with other architecture students, or he may find that he shares classes with students who are not training to be architects. He may find, for example, that he is studying some subjects alongside engineers, surveyors, landscape architects, town planners, or commercial artists.

National and school policies will also affect the composition of a school's teaching staff. In some countries it is normal for the teaching of architecture to be done by practising architects, and some schools insist on this for their staff. In other countries, such as Saudi Arabia, it is not possible for a teacher to be a practising architect, a further cause of the perceived gap between architectural education and practice in that country (See in particular Chapter 7 and Chapter 8).

Generally speaking the courses offered by schools of architecture are assessed and accredited (or not, as the case may be) by the professional association in the country concerned, or by its appointed agency. By no means every school which offers a degree or diploma in architecture is accredited, so that this means that graduates from these unaccredited schools cannot always practise as architects. However, in many countries mere graduation is not enough to become an architect. In the USA and in the western world, though not the United Kingdom, registration as an architect is also generally required. (Registration is, nevertheless, normal in the United Kingdom, and required for someone use the title 'architect'.) The latter is normally undertaken by a national professional association, and will not be granted on the basis of an architecture degree alone. A period of practical training, often in conjunction with professional examinations, is normally required. Such periods of practical training often involve a year or more 'out' of the academic school training. Professional schools vary in the extent to which they take an interest in this period: under some systems it is monitored by the school; under others it is not. (See Chapter 4 for a comparison of accreditation, registration, and other elements in architectural training and practice in the USA, the United Kingdom, and Egypt.)

Naturally in those architectural training systems where there is no national professional association, or where the period of practical training is not properly monitored, the academic education received is in itself likely to produce an underprepared architect (See Chapter 4).

For reasons largely connected with increasing technological complexity and with sociological and pedagogic factors, the professional school has now almost universally replaced the old pupillage system. It does not, however, cover an architect's training as the pupillage system did in its day. The areas which it does not cover, unless adequately covered by properly accredited practical training, mean that there must be a gap between architectural education and practice.

Indeed, as is pointed out by Richards (1974) some advantages of pupillage over architecture school training were lost when the schools first took over full-time training. The courses were fully academic, and the students were given no contact with the actual business of building. Since they were also not asked even to do any designing until the later parts of their course, some students discovered only then that they had no aptitude for architecture, none of the skills of hand, eye, and imagination that help to make a good designer. They had simply never worked in an architecture office, and did not know what was involved.

Undeniably, we can say that in the modern university system the gap between architectural education and practice is now clearer than ever, and, in those countries where there are effective professional associations, it is these bodies who are in the forefront of attempts to bridge the gap by means of practical training initiatives, accreditation of university courses, etc., as we shall see in the next chapter.

The gap between architectural education as provided in the universities and architectural practice has been the subject of some discussion in the last two decades. The gap as it is manifested in Saudi Arabia will be dealt with in depth when an analysis of the researcher's field trip interviews is made (Chapter 7 and Chapter 8), but it is something that has also been debated in other countries where the organisation of the practice and education of architecture is quite different from that in Saudi Arabia.

Indeed we have already seen (Chapter 1) that the ongoing debate about the gap between architectural education and practice makes two general points in respect of universities. One point concentrates on the relationship between architecture schools and the building industry and focuses on the view that architectural education is not receptive to the requirements of everyday professional practice. The other point is not specific to schools of architecture, but concentrates on the relationship in general between the university and society, highlighting the view that the universities as a whole are 'ivory towers' in a position of isolation from the world and from the needs of society.

The current organisation of architectural education in university-located schools, then, has both a strengthening and a weakening effect on the architect. Given the changes in client needs and in building technology and processes that have taken place in the past twenty to thirty years, which have led to rising expectations from the professions involved, the architect has been placed in a position of both greater vulnerability and increased strength. He is more vulnerable because as building becomes more complex and hedged with regulations, specialisations have developed and work previously done exclusively by architects has now become the domain of new professions. Yet the firm establishment of architectural education within universities has given it an intellectual and academic depth which has the potential to enhance the status of the practice of architecture and consolidate the standing of the architect within the professions.

3.7 Summary

We have surveyed the history of architectural education in relation to the evolution of the architectural profession from the earliest known times to the present virtually universal system of the university school of architecture.

We have seen how the five principal architectural education models, those of apprenticeship/pupillage, the art academy, the polytechnic, the Bauhaus, and the modern university have related to the prevailing concept of the architect and his work. With the exception of the apprenticeship/pupillage system, which prevailed from the earliest times and which indeed proved remarkably resilient in some countries over the centuries, the systems have to a greater or lesser extent developed out of responses to changes, whether technological, philosophical, or social, which defined the role of the architect. Indeed the training systems themselves stand in a symbiotic relationship to the practice of architecture, not only responding to changes in building technology and historical understandings of style and aesthetics, but also themselves serving in some measure to shape the understanding of the role and function of the architect.

In a further chapter we will give a more detailed description of the nature of architectural education in the USA, the UK, and Egypt. We will also provide a fuller account of the part played in these countries, where applicable, of professional bodies in responding to change and seeking to define the nature of the profession and protect the position of the architect.

Chapter 4

Architectural Education and its Relation to Practice: Case Studies

4.1 Introduction

In this chapter we will study architectural education in particular three countries, the UK, the USA, and Egypt. These three countries have been selected partly because they have each had an influence on architectural education in Saudi Arabia. In Egypt there is the longest standing architectural school in the Arab world, the *Mohandeskhana,* and when Saudi Arabia first wanted to set up architectural curricula it looked to Egypt as a model. In fact it was Dr. Ahmed Fareed Mustafa, an Egyptian professor, who established the first school of architecture in Saudi Arabia. The impact of the USA and Britain on the architectural educational of Saudi Arabia has also been considerable. Firstly, these two countries influenced the development of architectural education in Egypt, which means that they had an indirect influence on architectural training in Saudi Arabia. More directly, the first Saudi schools often had their programmes set up by American or British teachers. (For example, the architecture curricula of King Saud and King Abdul-Aziz Universities were designed by consultants from Rice and Harvard Universities respectively). Many Saudi students also went to the USA and the United Kingdom to gain their Ph.D.s. and on returning to teaching posts based their programmes on the countries where they had studied. Nowadays the teaching staff of Saudi architecture schools include many members from the United States, Britain, and Egypt. Also, much architectural work has also been done in Saudi Arabia by companies from the USA, Britain, and Egypt. Because there are no building codes and regulations in Saudi Arabia, these companies often used American or British codes and regulations.

It should also be noted that, as stated in the chapter on methodology (Chapter 2), the researcher made a trip to Egypt in order to gather information through interviews and visits to make up for the comparative lack of written material on architecture in Egypt.

We will focus on the university-based training that architects receive in the three selected countries, how it is organised, how it is linked to practice, etc. We will examine it under the headings of historical background, professional bodies, the route to the profession, academic studies, practical experience, quality control, and the registration process (including the registration examination, where appropriate).

4.2 Historical Background

In this section we will look at the history of the development of architectural education in the United Kingdom, the United States, and Egypt in order to shed some light on the position of training for the practice of architecture as it exists in these countries today.

4.2.1 The United Kingdom

We have already seen (Chapter 3) that the pupillage system developed into the main route to the architecture profession in the United Kingdom. It was not, however, the only path, and in fact it was just one of five routes identified by Crinson and Lubbock (1994) leading to architecture from the seventeenth century onwards. These five routes are briefly described below.

One of those routes was the Royal Works, especially when Sir Christopher Wren was in charge. Crinson and Lubbock write:

> The Royal Works under Wren's control produced many architects whose experience was formed in contact with the building crafts. Wren's Works was a form of quasi-medieval building lodge where the training certainly took place in the office, but also on site and working with and in the presence of the building crafts. (p. 16)

The Works system of Wren allowed those who took part to gain some knowledge of several of the crafts associated with building.

A further way to becoming an architect identified by Crinson and Lubbock was to be a member of the gentlemanly classes with a personal attraction towards architecture.

Such persons typically pursued design as a matter of intellectual interest, and erected their own buildings. Many such men, and indeed women, would have had training in mathematics, drawing, and surveying, and might have had their interest in architecture awakened initially through such disciplines.

The third route of Crinson and Lubbock was that of the master craftsman with a training in masonry, carpentry, or bricklaying. In this form of training a body of knowledge would be handed down from a master to his novice, and indeed the description given by Crinson and Lubbock is that of traditional apprenticeship. They also include in this category, however, surveyors, house agents, and building merchants. Those trained for architecture under this system did not generally have any knowledge of design theory, though Crinson and Lubbock indicate that 'they certainly had access to the tangible products of theory and could mimic its effects' (pp. 18-19).

The fourth path to architecture was that of those who were professionals in other fields. Crinson and Lubbock write:

> These professionals, like the aristocratic architects, were amateurs in architecture both in the sense that they maintained other strong interests and that they had no formal training for it. Many of the artist-architects owed their involvement in architecture to the Renaissance belief that the arts of painting, sculpture and architecture were simply three branches of the same art of design. (p. 20)

In many cases these professionals gained architecture status because of their appointment to positions in the Royal Works. Like the aristocratic architects, they were generally well-travelled individuals with some classical training and knowledge of foreign languages.

Crinson and Lubbock's fifth route to architecture is that of pupillage, which is well covered in this study in Chapter 3. It is worth noting, however, that Crinson and Lubbock see the delegation of duties in the royal Works as the basis upon which the pupillage system was modelled. They explain:

> Pupillage depended on a well-organised office through whose hierarchy and division of labour an aspirant architect could be developed. This form of training increasingly came to dominate. (p. 22)

The efficacy of the apprenticeship/pupillage method began to come under threat late in the eighteenth century. Until then British architects had been content to develop the single tradition that had shaped architectural education for many years and the technical requirements of building were relatively uncomplicated, so that pupillage, at least in principle, was an adequate training method. In practice pupillage could be good or bad, depending on the qualities of the master, and some architects could exploit the system by taking the money and simply using their pupils as assistants (Crinson and Lubbock, 1994). In 1890 the RIBA attempted, but with limited success, to regulate pupillage by issuing a model form for articles but even before that, as early as the 1840s and 1850s, there was much criticism of the system. Startup (1983) explains:

> Some control and regulation of the application of a knowledge practice and of design was called for. There had to be a consensus about what to learn, if, indeed, design could be taught at all. Anxiety about the widely differing experiences of pupillage fostered the idea that there might be advantages in setting up formal training and qualification structures by the RIBA and others. (p. 47)

Davey (1989) also points to the dissatisfaction which many felt with pupillage in the time before architectural education moved to schools of architecture. He writes:

> The problems of architectural education . . . had rumbled throughout the nineteenth century - Pecksniff was stealing his pupil Martin Chuzzlewit's designs as early as 1844 and, from its inception 10 years before, the Institute of Architects had been concerned with issues of professional competence and ethics, both of which had implications for education. (p. 59)

On a more general socio-economic scale it was, however, the Industrial Revolution which gave the main impetus to a change in the apprenticeship/pupillage system of architectural education.

Burston (1995) writes:

> The Industrial Revolution brought sweeping changes. There was a great increase in industrial development and in the rate at which society and technology were changing. There was also a population explosion and a migration to the towns. This provided a great need for new building, and produced a large middle class of businessmen and professionals, politicians and administrators. . . Thus the Victorian architect needed to be a 'professional' who was

> of similar social status to his clients, and whose training gave him the required technical expertise. (p. 13)

The Romantic movement of the late eighteenth and early nineteenth centuries, with its emphasis on content and feeling rather than order and form, further complicated matters by offering yet wider options to architects. The offices of practising architects, which had hitherto been locations of common professional training, were reduced to dissociated units, each going its own way. The way was open for the architecture profession to be trained in universities and this is described below.[5]

As elsewhere, architectural training in the United Kingdom has gone through a development from the old pupillage system to the professional school system which prevails today. Although the 'art academies' had some conceptual and philosophical influence in terms of design and approach, they did not have as great a measure of direct influence on architectural education as they had in the USA. In particular there was no equivalent in the United Kingdom of the large numbers of Americans training in Paris or seeking to train in an American school with Beaux Art-trained teaching staff (See Section 4.2.2) - although the French *atelier* system became the model for United Kingdom educationalists (Louw, 1997) - or the 'transplant' of the Bauhaus to Chicago that occurred in the 1930s.

Pupillage lasted well into the twentieth century in the UK, and was the accepted route to becoming an architect until it was replaced by a part-time training carried out at recognised architecture schools that led to a professional examination administered by the Royal Institute of British Architects (RIBA). Indeed there are some who argue that pupillage had not died out even by the mid 1980s (Suwayeh, 1985).

As we have seen above, pupillage was not the <u>only</u> route to architectural success in Britain in the time before the establishment of architecture schools (Crinson and Lubbock, 1994). We have already commented that in Britain in the period from the sixteenth century to the early nineteenth century most substantial buildings were

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[5] For more information on the development of architectural education in Britain from pupillage to professionalism refer to A. A. Powers, <u>Architectural Education in Britain, 1880-1914</u> (1982)

commissioned by the ruling classes or by wealthy institutions (Chapter 3). Such clients turned when they wanted to get buildings designed to people who were themselves scholars and gentlemen, and who had a wide education and range of general interests (Burston, 1995). Nevertheless, pupillage was the most readily available route open for a youth set on becoming an architect before the days school-based architectural training.

We have already mentioned that it was not uncommon for would-be architects under the pupillage system to attend evening lectures (See Chapter 3), and by the middle of the nineteenth century some architecture courses had been set up in Britain, initially in London at King's College and University College and the government Schools of Design. An Architecture chair was established in University College in 1841 and around the same time civil engineering and architecture began to be taught at King's College. The RIBA itself, in connection with its setting up in 1863 a board to conduct a voluntary technical and professional examination, offered lectures to students by distinguished members of the architecture profession, and the Architectural Association, founded in 1847, offered in 1869 classes in design, construction, and practice (Davey, 1989). In 1890 the AA set up more formal lectures and a studio was established. A four-year part-time course, designed to enable the student to pass the RIBA's examinations, was offered (Davey, 1989). The push towards professional architecture schools and eventually departments of architecture in modern universities was well under way in the UK. (Crinson and Lubbock, 1994). The first full-time school of architecture in the UK was set up at the University of Liverpool in 1895. Early university architecture courses emphasised design and control rather than construction, which is still the norm in universities. Crinson and Lubbock (1994) write in this context:

> There grew to prominence an approach to teaching and architectural style . . . which concentrated on the architect's metier as the producer of drawings and co-ordinator of the works, not as someone who was involved in craft or construction or the structural side of architecture. The divorce between the metier of the architect and that of the builder, of the engineer, of the surveyor or of the developer was complete. (pp. 89-90)

After the RIBA established its own examination in architecture in 1863 and made it compulsory in 1882, and later, responding to requests from schools by embarking on the recognition of courses and of examinations considered to have achieved the necessary minimum standards for exemption from that examination. In 1924 the Visiting Board was established to visit schools to assess the effectiveness of courses and examinations in reaching the standards necessary to prepare students for the professional practice of architecture (RIBA, 1988).

Despite the earlier moves in the nineteenth century, it was many years before a university-based training became the common route to the profession for UK architects. The movement for full-time education, which had for many years been the aim of the RIBA, had gathered sufficient momentum by the 1950s that in 1958 a conference at Oxford agreed upon the fundamental plan for architectural education in the UK (Louw, 1997). The importance of this conference for the future of architectural education in the United Kingdom was great. Startup (1958) says of it:

> Its recommendations, quickly accepted by both the RIBA Council and its Board of Architectural Education, set in motion the radical reorganisation of architectural training - indeed, a new understanding of what training and professionalism meant was posited at Oxford. (p. 47)

Six basic recommendations were made by the conference:

1. Entry for training to the profession should be raised to at least two 'A' Levels (in Scotland 3 SCE passes at 'Higher' grade and two at 'Ordinary' grade).
2. Courses based on RIBA examinations were to be progressively phased out.
3. Recognised schools of architecture were to be in universities or similar institutions.
4. Courses were to be either full-time or sandwich courses.
5. Other forms of training not leading to an architecture qualification would have to be devised.
6. Postgraduate work was essential and should be expanded. (Burston, 1995; Louw, 1997)

It was thus the profession in Britain which led the way in insisting that architectural education should be full-time and academic, which is reflected in the present strong ties between the profession and education and the tight control over architectural education by RIBA, the professional body. The place of architecture in British higher education institutions, however, has not always been easily occupied. Before the year 1993 higher education in the UK had as one of its main features the so-called binary system. Under this system the universities concentrated on traditional humanities subjects and on science subjects in an academic context, while the polytechnics focussed on vocational training. Universities had more difficulty with architecture than did polytechnics. In polytechnics, especially where architecture was combined with other professional building courses, it was looked upon as a good example of an integrated vocational course. But the universities, with their greater emphasis on academic work, offered a less comfortable home to architecture with its studio culture. The fact that architecture seemed not to fit with traditional universities so well meant that it was vulnerable when such institutions sought to cut departments to save costs; on the other hand architecture came under fire from the profession if it attempted to follow academic practices on research and science-based teaching methods (Louw, 1997). This is an example of the tension between the school and the host university on the one hand, and between the school and the profession on the other.

4.2.2 The United States of America

Architecture was practised in what is now the USA from colonial times until the beginning of the present century by builders and designers who were either self-taught or who had had the relevant skills and knowledge passed down to them as from a master to a pupil. The original method of training for the profession of architecture in the USA was therefore, as in other countries, through a period of apprenticeship or pupillage in the office of an architect (Bunch, 1993). This remained so despite early attempts by Thomas Jefferson, the only architect to be a US President, to include architecture in the curriculum of the University of Virginia in 1814. An early awareness of the desire to seek some kind of professional organisational affinity, if not professional regulation, was the foundation of the American Institute of Architects (AIA) in 1857.

Indeed it was not until the Morrill Act of 1862, which made segments of public land available for the building of technical institutions, that the impetus for the first professional schools of architecture emerged. The first school of architecture, which opened in 1865, was that of the Massachusetts Institute of Technology (MIT). In December of that year William Ware, Professor of Architecture, presented to the MIT

Society of Arts his Outline of a Course of Architectural Instruction. It was clear from the content of the paper that Ware was conscious of the pioneering work being done at MIT, for he stated that the purpose of the proposed programme in Building and Architecture was to 'furnish the instruction that cannot be obtained elsewhere' (Ware, 1866) and that 'such instruction as is here proposed is not now anywhere offered, it is believed, within the limits of the United States' (Ware, 1866). It is noteworthy, in the general overall context of the relationship of architectural education to practice, that Ware suggested that the architecture student should spend some time as 'an assistant draughtsman in an architect's or builder's office'. (Ware, 1866). At least on Ware's part there was an appreciation of the need for architecture students to familiarise themselves with the day-to-day business of architecture before entering the profession full-time. Indeed it was one of Ware's precepts that details of a practical nature that can be learned in an office should be postponed until after formal education.

Ware also held that courses in construction and history could be taught by 'cooperative student investigation'. He also believed that architectural design should be learned through competition (with judgments by juries), that design should be studied through an entire architecture course, and that design problems should not be too practical, but rather should stimulate the imagination of student through the study of great masters. He further sought to emphasise the importance of study of construction, and that the architecture curriculum should cover as broad a cultural background as possible (Boyer and Mitgang, 1996). It is clear that the French influence of the Beaux Arts understanding of architecture played a considerable part in his thinking, as it was to do in the study of architecture generally in the USA.

The school at MIT was followed by Cornell University in 1870 and the University of Illinois in 1871. This was the start of what has now become the norm for the teaching of architecture in the USA, though both the profession itself and training remained largely unregulated during the nineteenth century. Only in 1897 did Illinois become the first state to require a licence to practice architecture. With the rise of the city, the appearance of new building materials, designs, and techniques, and the establishment of new transport systems, the need was made all the greater for professionalisation in architecture (Cuff, 1991).

By the end of the nineteenth century there were nine architecture schools in the country, with a total of 384 enrolled students. Yet there were over 10,000 persons calling themselves architects in the 1900 population census.

Most of the existing architects at that time must have entered the profession under the old pupillage system (Prestamo, 1990), not through school training. Furthermore the figure of ten thousand plus must have included many who had trained since the establishment of architecture schools, and if a figure of under four hundred students enrolled in architecture programmes at any one time by 1898 is correct, it was presumably no greater in previous years. This must mean that substantial numbers of persons entering the architecture profession in the USA by the turn of the century were still not being trained in the schools.

During the late nineteenth century an increasing number of architecture students from the USA sought their professional education, not in an American school, but in the Ecole des Beaux Arts in Paris, and indeed we have noted above how the philosophy of the Beaux Arts had already influenced Ware. Efforts were made to introduce the Beaux Arts *atelier* instruction system in America. In 1894 a Society of Beaux Arts architects was formed in the country with the aim of setting up an architecture school on the French model, though this was never in fact done. With the influence of the Beaux Arts having been felt in the USA for some time before this, it was not uncommon for schools to have at least one member of the teaching staff who had trained at the Beaux Arts (Bunch, 1993).

This influence meant that the Beaux Arts method of architectural education became very important in the USA. The essence of this system was the design problem allocated to a student, who then sought solutions to this problem under expert supervision. Projects were judged, normally on the basis of excellence in traditional draughtsmanship and on aesthetic grounds, by a jury of architecture teachers and practitioners. The jury system is still used in many US schools and indeed in many countries today.

As the twentieth century advanced, architectural training in the USA gradually moved away from Beaux Arts influence. Bunch (1993) puts it thus:

> Eventually both the United States and Canada began to outgrow their European dependencies as their cultural identities evolved. The idea of personal worth, personal responsibility for one's station in life, personal responsibility for one's actions as well as individualism, all had a powerful effect on American architecture. By 1901 other more external pressures were being applied that led to change. The advent of modern architecture in Europe, the growing popularity of the Chicago skyscraper idiom and Frank Lloyd Wright's 'Prairie School' collectively contributed to change in architectural education. (p. 7)

Boyer and Mitgang (1996) also comment on the changes that began to take place in American architectural education:

> An early history of architecture education by Arthur Clason Weatherhead[6] noted that the typical curriculum in the early twentieth century lacked cohesiveness, the business side of architecture was neglected, and there was little effort to aid the transition of students between the academy and the office. Graduates gained a strong sense of design, were resourceful in solving problems in artificial settings, and well versed in Beaux Arts logic, but their thinking tended to be two-dimensional.
>
> Following World War I, the competitive precepts of Beaux Arts were increasingly questioned. By the 1920s and 1930s, the coming of modernism, the growing rejection of Neoclassicism, and the emergence of urbanism led to a fundamental reconsideration of architecture education. . . Modernism powerfully affected the curricula at many US schools. Stiffer course requirements were introduced, the study of materials and construction was emphasised, more schools related themselves to allied professional fields, and schools began to explore the relationship of architecture to human and community needs. (pp. 16-17)

Influences on architectural education from outside the USA did not, however, disappear. Indeed there were movements in some architectural education establishments towards the German Bauhaus school, and the stress on materials and construction noted above by Boyer and Mitgang is typical of it. The Bauhaus movement (See Chapter 3) originated in Germany in the years following the First World War and was eventually driven out by the Nazis. The Bauhaus exhibited an interest in and a respect for material

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[6] Published in 1941.

and embraced technological innovation, in contrast to the Beaux Arts. Teaching under the Bauhaus philosophy was practical, involving actual work with buildings under construction. One of the movement's leaders, Walter Gropius, came to the USA and was from 1938 until 1952 the head of the Department of Architecture at Harvard. Also in 1938, his Bauhaus school colleague Ludwig Mies van der Rohe became head of the Architecture school at MIT. With the arrival of Gropius Harvard integrated architecture, landscape architecture, and urban planning into one school, along the lines of the schools of environmental design that prevail today.

As far as organisation and structure in training and in the architecture profession were concerned, things had also been moving in the twentieth century. In due course the early architecture schools, to a large extent, standardised their training, with a sharing of ideas for the furtherance of architectural education (Sherman, 1974). By the year 1912 a further eleven schools of architecture had been added to the nine in existence at the turn of the century, most of them in universities, and most of them looking towards the MIT school as their model. In that same year, at the annual convention of the AIA, architecture teachers from some of the country's universities expressed their concern over architectural training, and there resulted from this the foundation of the Association of Collegiate Schools of Architecture (ACSA). This was a further step in the gradual movement that has resulted in today's entirely school-based architectural education, a process which has not always had beneficial effects, as observed by Boyer and Mitgang (1996):

> The shift from the apprenticeship system planted the seeds of separation between education and practice. Because education, organizationally, has been divorced from the practice world, schools have had to make extraordinary and costly efforts to help students gain real-life experiences, such as field trips, undergraduate internships, or preceptorships. (p. 18)

Other developments in the training of architects in the USA included the founding, in 1919, of the National Council of Architectural Registration Boards (NCARB), and in 1940 the National Architectural Accrediting Board (NAAB) was set up by the ACSA, the AIA, and the NCARB. An account of the part these bodies play and have played in architectural education in the USA is given in Sections 4.4.2 and 4.5 2.

The architectural educational process in the USA has evolved from a single programme organised in the MIT in 1865 to a system serving the nation, and one that is well recognised internationally. Boyer and Mitgang (1996) sum it up it thus:

> What has emerged, then, over the past century, is an ordered, university-based educational system marked by a high degree of professionalization and regulation. Together, the 103 accredited schools of architecture, the five national architecture organizations, their publications, and leading architectural journals act as the guardians and arbiters of the language and traditions of the profession, the awards and recognition programs, the educational performance objectives, and the legal terms for admission to practice. (p. 19)

4.2.3 Egypt

The situation with architectural education in Egypt is somewhat different from that in the USA and the United Kingdom. One factor in this difference is that Egypt has not had *uninterrupted* independent sovereign nation status through the last two or three hundred years. At various times it has been under the rule or the domination of Turkey, France, and Britain. This means that these countries have influenced Egypt's institutions in the last few centuries, including its educational system, and that it has not had as long a period of autonomy to develop its own structures as even a relatively young country like the United States.

In considering architectural education in Egypt a further important fact has to be borne in mind. In that architecture was, and still is, considered to lie within the field of engineering (Suwayeh, 1985; Barrada, 1986; Bakeet, 1996). In any case, many buildings in Egypt are erected without the assistance of architects at all. Since the law requires only a qualified engineer to be responsible for buildings, civil engineers often actually design buildings.

The first secular schools of any type in Egypt were established after the invasion of the French under Napoleon Bonaparte in 1798. Although the French were expelled in 1801 their short occupation had a great impact on Egypt's future, for they brought the country into close contact with the West.[7] After the expulsion of the French, Muhammad Ali (r. 1805-1848) - who had succeeded in driving out the Ottoman Governor of Egypt -, asserted absolute control and became the ruler of Egypt. During his rule Muhammad Ali pursued a policy of reform and modernisation. He was responsible for starting many schools based on French models. During his rule western influence increased with the arrival of European teachers and the exportation of Egyptian students to Europe for training (International Encyclopedia of Higher Education, 1st ed., s.v. 'Egypt, Arab Republic').

At the start of the nineteenth century there were no pure architecture schools in Egypt. Much architectural work was therefore carried out by foreign architects. In modern times architectural education in Egypt started in the *Mohandeskhana*, which was established in Cairo as an engineering school in 1820, following the polytechnic model (See Chapter 3). It was followed by another school, also in Cairo, in 1834 (Barrada, 1986; Heyworth-Dunne, 1938).

The School of Works was set up in 1839, and other engineering schools became affiliated with it, although it was not to enjoy uninterrupted existence in the decades to follow (Barrada, 1986).

In 1858, following the *Mohandeskhana*, the *Madrasat Al-Imarah* or Ecole d'Architecture was established as an intended independent school of architecture during the reign of Muhammad S^{c}ad (r. 1854-1863). The European influence could be seen as the school followed, once more, the polytechnic model. Most of its teaching, hence, was in engineering rather than architecture, a further illustration of the understanding in Egypt of architecture as part of engineering that we have already noted.

A new *Mohandeskhana* school was set up in 1866, and it was finally situated in 1905 in Giza, the location of Cairo University. After several name changes the school became the Faculty of Engineering, and it encompassed a Department of Architecture. This is

[7] During this period Napoleon's military engineers prepared a set of measured drawings of all the country's historic buildings, including Pharaonic and Islamic buildings. This set was later published as 'Description de L'Egypte'.

an illustration of the fact that we have already noted, namely that architecture in Egypt has been conceived as a branch of engineering, and not something with its foundations at least partly in art or as a discipline with any aesthetic aspect to it.

Özkan (1989) indicates some of the early influences on Egyptian architecture schools:

> Architectural education was monitored by civil engineers, and architectural skills were conceived merely as a means to prettify sound buildings, which were the ultimate goal. (p. 105)

Writing of architecture in Egypt Barrada (1986) states:

> It was seen as merely that part of civil engineering that dealt with buildings, which were traditionally less important than the construction of canals, dams and roads, which were the life and soul of Egypt's agricultural society. Even in 1960 Cairo University's architectural education started with a general preparatory year and a first and second year of joint study with civil engineering. Tying architecture with the faculties of engineering is still the pattern in the departments of architecture that were set up in Alexandria in 1941, in Ain Shams in 1950, in Assiut in 1957, in al-Azhar in 1964, in Shubra in 1975 and in Mataria in 1980.
>
> The long association with the faculties of engineering has forced most of the departments to adopt the same methods of teaching, exams and, in many cases, courses as the engineering departments. This has encouraged the conception of architecture as a profession based on technology and engineering. Even the schools established within the Faculties of fine Arts in Cairo and Alexandria, surprisingly, fell in line with the others and sought the title of 'Architect Engineers' and the acceptance of the Syndicate of Engineers. (p. 182)

Today, a dozen years after Barrada wrote, architectural education in Egypt is still for the most part conducted in departments of architecture affiliated with colleges or faculties of engineering within universities.

Later architectural education in Egypt shows the influence of European, and in particular French, training methods. This time the influence came direct from the Beaux Arts. Özkan (1989) elaborates:

> The years between the two World Wars were crucial . . . as they witnessed a complete transformation in the organisation of the architectural profession and allied institutions. A large group of

> Egyptian students went abroad to study architecture, many of them to Paris, As a result the Beaux Arts model of architectural education came to be favoured, reinforced by the strong cultural ties linking Egypt and France. At that time not only did the School of Architecture at Cairo University come to be dominated by Beaux Arts ateliers, but a new school that was established in Alexandria adopted the same model in the 1940s. (p.106)

The influence of the Beaux Arts was, however, limited, as it came at a time when the Beaux Arts was giving way to the Bauhaus, which was more compatible with an engineering approach.

4.3 The Role and Functions of the Architect

In this section we will focus on the role and function of the architect in the three selected countries as these are delineated in the literature produced by the professional associations concerned.

4.3.1 The Role of the Architect in UK

The role of the architect in the UK is described in the RIBA Architect's Appointment (1988). It should be noted that this description of the role of the architect is not intended as a definition of the term 'architect', but rather an account of how the RIBA understands his function. The RIBA (1988) states:

> The education and training of architects prepares them to assist clients at all stages of a building project and to co-ordinate all the elements of the design and construction process. The architect's primary professional responsibility is to act as the client's adviser and additionally to administer the building contract fairly between client and contractor. (p. 1)

Services normally provided by architects progress through work stages, designated as preliminary services and basic services, based on the RIBA Plan of Work. These are work stage A (inception), and work stage B (feasibility) - which are designated preliminary services - and work stage C (outline proposals), work stage D (scheme design), work stage E (detail design), work stage F (production information), work stage

G (bills of quantities), work stage H (tender action), work stage J (project planning), work stage K (operations on site), and work stage L (completion) - all of which are designated basic services. The sequence of work stages may be varied or two or more work stages may be combined to suit the particular circumstances.

The RIBA also point out that many projects will require other services which may augment the Preliminary and Basic Services of which may be the subjects of a separate appointment. It states:

> The extent to which additional consultant advice will be required depends on the nature and experience of the architect's practice and on the complexity of the project. The provision of such other services should be discussed at the outset of any project. (1988, p.1)

In the United Kingdom the title 'architect' is protected by law and so may only be used by qualified persons registered with the Architects Registration Council of the United Kingdom (ARCUK). The practise of architecture, however, is not.

4.3.2 The Role of the Architect in USA

The role of the architect in the USA is laid out by the AIA in the following terms:

> Architects are trained in the art and science of building design and are licensed to protect public health, safety, and welfare and transform these needs into concepts and then develop the concepts into building images that can be construed by others. In doing so, architects communicate between and assist those who have needs: clients, users, the public as a whole, and those who will make the spaces that satisfy those needs: the builders and contractors, plumbers and painters, carpenters and air-conditioning mechanics. (AIA, 1989, p. 1).

> Whether the project is a room or a city, a new building or the renovation of an old one, architects provide the professional services, ideas and insights, design and technical knowledge, drawings and specification, administration, coordination and informed decision making that balance an extraordinary range of functional, esthetic, technological, economic, human, environmental and safety factors into a coherent and appropriate solution for their needs at hand. (AIA, 1989, p. 1).

> The architect's job is fundamentally to translate the needs, wants, and desires of the client into functional solutions that reconcile cost, legal criteria, technical limitations and site considerations into a viable solution. All of these components must optimally deal with the needs of the user client. The architect is: artist, philosopher and technocrat. He or she must simultaneously become manager and designer. The architect must balance the function, form and structure of the design solution with all of the criteria already mentioned. The job of an architect is to a large degree not only multivariate, but simultaneously unit specific. It is in this environment that an educator must prepare the student to perform a multiplicity of tasks of which design is incrementally one of the most important. (AIA, 1989, p. 1).

In the USA, unlike the United Kingdom, the title 'architect' is not protected but practising architecture is, since it is only permitted to those who register as architects in any one state. Registration in any one particular state of the USA., however, does not automatically entitle one to practise architecture in another state.

4.3.3 The Role of the Architect in Egypt

The Egyptian Engineering Syndicate (1974), in Article 3 of its constitution, defines the role of the architect. It states: 'The role of the architectural engineer is to produce the design concept, working drawings, and bills of quantities for buildings, and to plan cities and villages.'

The Syndicate insists that, in order to practise as an architect, an individual must hold a Bachelor's degree in Architecture or its equivalent and he must be a member of the Engineering Syndicate.

In Egypt neither the title 'architect' nor the function of the architect is protected, and because architects and engineers are members of the same syndicate, any engineer can call himself an architect and can design buildings. Indeed all the individuals who are members of the Engineering Syndicate, whether they are actually engineers or are in fact architects, are known as engineers to the general public. In an interview with Miles Danby (1997) the researcher was informed that the use of the description 'engineer' for an architect in the Arab world came about historically through a linguistic misunderstanding. When the French established the first school of architecture in Egypt, the Ecole d'architecure, the word 'architect' was translated into Arabic as *Muhandis*, which means literally 'engineer'. The correct translation of architect, however, is *Mimari*. Ever since, the word 'engineer' has been used to designate an architect.

However, the situation where the 'wrong' term is applied to architects would never have survived had it not also been for the fact that the role of the architect is not so distinctive or so clearly defined as in, for example, the UK, in the Arab world as a whole.

The fact that the position of the architect is not protected or of a particularly high status in Egypt manifests itself in the type of buildings that are currently being erected. Barrada (1986) in fact even argues that there are few buildings in Egypt that merit the description of architecture, and asserts that architects concentrate on achieving the cheapest production that they can. They have, he believes, no interest in aesthetic matters or the needs of the users of buildings.

Up to 60 percent of buildings in towns and cities are produced by non-architects, but their efforts are, as might be expected, no better than those of architects, since the architects provide poor examples for them to follow (Barrada, 1986).

4.4 Professional Bodies

Allen (1995) comments on professional associations in a British context as follows:

> Most laymen are familiar with the fact that British professional bodies exercise a powerful influence over their members. . . What is not quite so well known is that many professional bodies also have a powerful influence over universities.
>
> Universities were in many instances slow to react to demands for courses which were relevant to the professions. . . Eventually, however, pressure from the professional bodies, coupled with the universities' self-interest, saw to it that the needs of most professions were recognised by the universities, albeit reluctantly. But the relationship between the two sides remains a sensitive one, with the professions often claiming the right to determine standards

> and curricula, and the universities insisting on academic autonomy. (p. 83)

Allen points out that the present position exhibits considerable variation, with the influence of some professional bodies being slight while the power of some others is much greater. An instance of the latter is the RIBA in the UK. The maintenance of a satisfactory system of training is a major objective of the Institute and it has developed complex means to reach this goal. In the USA professional associations have also influence over education but unlike the UK, where the power is in the hands of one association, the power in the USA is divided amongst AIA, NAAB, and NCARB, as we will see later in this chapter. As is the case in Egypt, the influence of professional bodies is not always that strong. Allen (1995) sums up, with particular relevance to the architecture profession:

> It is clear that the influence of the professional associations upon the universities is extensive and increasing: in general, their major concern is to ensure that universities can produce competent members of their profession. To that extent, they can be said to have brought about the goals of universities in some detail, and to have considerable influence in determining the implied goals of certain courses. With the passing of time, the senior officers of each association will tend to become those who entered the profession through the university route rather than the old extra-university route: their interest in universities, and their ability to influence them, will probably be greater than at present. The growing interest in refresher courses and continuing education will also ensure a larger measure of involvement on the part of the professions. (p. 84)

Although the status and the precise role of professional architecture bodies vary between countries, there are certain fairly common areas of interest. These include, as indicated by Orbasli and Worthington (1995):

1. Protection of the title 'architect' (though not in the USA).
2. Conditions of registration.
3. Client relationships.
4. Representing the profession to government and local government authorities.
5. Setting educational curricula.
6. Guaranteeing educational quality.

7. Developing the knowledge base, through funding, research, publications, and exhibitions.
8. Ongoing professional development.
9. The defined duties of the architect.

Regarding the relationship of professional associations to education, Orbasli and Worthington (1995) point out that this is clearly an area of crucial importance to professional architecture organisations, and the profession's relation to it can be expressed through formal involvement in course validation, course content, higher education funding, quality control, research, and continuing professional development

In this section we will look at the professional bodies in the three selected countries, and the role they play in the organisation and control of architectural practice and education in the countries concerned.

4.4.1 Professional Bodies in the United Kingdom

In the UK the two bodies protecting the architect's position within the building industry are the Royal Institute of British Architects (RIBA) and the Architects' Registration Council for the UK (ARCUK).[8]

The RIBA was founded in 1834 (as the Institute of British Architects), and established during its first fifty years many of the activities that still characterise its work (RIBA, 1991). The purposes of the RIBA were stated in the first Royal Charter as: 'The general advancement of Civil Architecture, and for promoting and facilitating the acquirement of the knowledge of the various arts and sciences connected therewith' (RIBA, 1991).

The ARCUK set up by the 1931 Act (sometimes referred to as the Principal Act) has three main duties:

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[8] The Architects Act of 1997 reorganised ARCUK with a greater emphasis being put on the protection of consumer interests. In addition, its name was changed to the Architects Registration Board for the United Kingdom (ARBUK).

- The maintenance and annual publication of the Register of Architects.
- The maintenance of correct standards of professional conduct.
- The award of scholarships and maintenance grants to students of architecture who lack sufficient means to pursue their studies (RIBA, 1991).

The RIBA (1990) itself gives this account of registration (and membership) requirements in the UK:

> The Royal Institute of British Architects (RIBA) is the main professional body for architects. It is an independent body and was set up by Royal Charter in 1837. Membership is voluntary and the institute is governed democratically by its members. Nobody may practise under a title containing the word "architect" in the United Kingdom, subject to a few statutory exceptions, unless their name is on the statutory register of architects. Admission to the register is the responsibility of the Architects Registration Council of the United Kingdom (ARCUK), set up by an Act of Parliament in 1931. . . Qualifications for membership of the RIBA and registration are by and large similar.
>
> To qualify for RIBA membership and for statutory registration a minimum of seven years of higher education and training are required. . . At the end of the seventh year candidates for entry to the profession are eligible to sit an Examination in Professional Practice and Practical Experience and must pass such an examination before admission to membership of the RIBA and registration. (p. 1)

The RIBA fulfils its objective of the general advancement of architecture in a number of ways today. It seeks to affect public opinion and government action by its environmental activities, it seeks constantly to provide effective support services for architecture practitioners, it seeks to improve the status of the architecture profession through ongoing professional education and research, and it seeks also to establish legal, technical, and financial parameters within which architecture is carried out. It is concerned to underpin the position of the architect within the building industry by providing a unique design service, and, most importantly in the current context, the RIBA seeks to face any challenges that might arise to the architect's role through changing technology and building practices (RIBA, 1991).

In terms of administrative staffing structure, the RIBA is headed by a Director-General and has several permanently staffed departments. The Institute is governed by a Council under the chairmanship of a President, and has a number of committees and sub-committees. Those departments of most importance for practising architects are Practice committee, Education and Professional Development committee, the British Architectural Library committee, Membership and Overseas Affairs committee, and Marketing committee (RIBA, 1991).

Through its Practice committee, and Education and Professional Development Committee the RIBA organises both wings of the profession, practice and education. The remit of the Practice Committee includes competence amongst practising architects and the factors which exercise an effect on the conditions under which they work. It has to do with such matters as terms of appointment, fees, control of building, of planning, and of development, architecture research, construction standards, insurance issues, good practice and quality assurance, code policy, and relevant European legislation.

The Practice Committee, moreover, orders practice through the control of the conduct and performance of its members. There exists a Code of Professional Conduct, which was introduced in 1981 and is kept under constant review. The Code aims to promote the standard of professional conduct of RIBA members. Student RIBA members are also bound by the Code.[9] The RIBA has produced in this connection two publications, Guidelines for Sound Practice and Standard of Professional Performance.

As a way of organising practice and to keep its members and the schools and their students up to date with practice, the RIBA maintains a publishing arm, RIBA Publications. It provides editorial input and has its own publishing imprint; it also sells a wide range of architecture and construction-related books. The *RIBA Journal* is published by RIBA Magazines, and it contains a supplement which keeps members up to date with current practices and issues in architecture. (RIBA, 1991).

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[9] For a full version of the RIBA Code of Conduct see Architect's Handbook of Practice Management, RIBA, 1991, pp. 31ff.

A further instrument to the organisation of practice is the Education and Professional Development Committee. It deals with educational standards in recognised architecture schools, with standards of entry to the architecture profession, and with ongoing professional development, as well as with environmental education it the broadest sense. (RIBA, 1991).

One of the functions of the RIBA is the regular review and updating of its Guideline Syllabus, its Professional Practice Examination, and its Practical Training Scheme. The purpose of this review, and of any recommendations that result from it, is to make sure that the Institute's Practical Training Scheme and the Professional Practice Examination stay relevant to current practice, and to secure the continuation of high standards both in professional training and in the running of examinations.

The contact between the schools of architecture in the UK and the RIBA is described in this way by the RIBA (1990):

> The RIBA and the schools keep in touch by a variety of methods. Heads of schools, staff and students serve on the Education Committee of the RIBA and on the RIBA Council. There are regular meetings of heads of schools. The RIBA, by its Visiting Board, keeps in close touch with developments and can give the schools support in safeguarding teaching resources and in obtaining extra equipment or improved accommodation. There is also an RIBA Committee which oversees major changes in curricula, so that a school wishing to change the pattern of its course can do so with the reasonable expectation that its recognition will not be jeopardised. (p. 3)

It is clear, then, that while the RIBA is an important source of assistance for architectural schools, it also exercises considerable and even decisive control over major curriculum matters.

The RIBA is regarded as the one organisation that is strong enough to stand up for architectural education against government interference, and it is looked upon as a defender of the culture of architecture. Both the profession of architecture and architectural education are controlled by the RIBA, that is, by the profession itself.

4.4.2 Professional Bodies in The United States

There are now five bodies in the United States which regulate and monitor the architecture profession and influence the structure and content of architectural education on a national basis: the American Institute of Architects (AIA), the Association of Collegiate Schools of Architecture (ACSA), the National Council of Architectural Registration Boards (NCARB), the National Architectural Accrediting Board (NAAB), and the American Association of Architectural Students (AIAS).

The AIA was founded in 1857. This was the expression of an early awareness of the desire to seek some kind of professional organisational affinity in the field of architecture. It is a voluntary advisory association of architects and its functions have been promotion and advancement rather than regulatory. The ACSA, founded in 1912, represents all professional architecture schools in the USA (and Canada) to advance the quality of architectural education and to promote research in the field of architecture through support of architecture schools and their teaching staff. A school must belong to the ACSA in order to qualify for consideration for accreditation. The NCARB was established in 1919. It consists of the regulatory boards for architecture in the states of the USA and aims to assist its members to carry out their duties in protecting public welfare. It does not have the power to regulate architecture schools and does not deal directly with them except through the NAAB. The AIAS represents the interests of the students of architecture in the USA. It promotes and supplements architectural education, and acts as the voice of the students to the profession and to the public (Bunch, 1993; NAAB, 1995). The NAAB is the actual accrediting body, being recognised by the US Department of Education for the accreditation of professional degree programmes in architecture.

Structurally, the NAAB is run by a Board of twelve directors, which serves both as a decision making and as a policy-making body. Of these twelve directors, a total of ten are nominated from the ACSA, the AIA, the NARCB and the AIAS. These nominations from different bodies mean that all the stakeholders have a say in decisions affecting architectural education.

The NAAB, as indicated above, is the body which has direct accrediting involvement with the schools of architecture and thus with architectural training. It was set up in 1940 by the ACSA, the AIA, and the NCARB. The NAAB was a conscious attempt to regularise accreditation throughout the United States and to determine equivalency between institutions in different states. Its foundation can be traced to architectural registration legislature that was passed in the state of Illinois in 1897, and based on Illinois's registration system for the professions of medicine and law. A few years later Illinois recognised the architectural training provided by out-of-state schools such as those of MIT, Cornell, and Harvard, and this move clarified the need for cross-state accreditation and recognition agreements.

The NAAB writes of its own mission statement:

> NAAB has historically defined its primary mission as being "to create and maintain conditions that will encourage the development of practices suited to the conditions which are special to the individual program" and "assist in developing programs fulfilling the broad requirements of the profession of architecture". In recognition of the collateral organizations' objectives to "advance architectural education" (ACSA); "provide the best possible education in the schools of architecture" (AIA); "promote excellence in architectural education" (AIAS) and "encourage and improve formal architectural education" (NCARB), NAAB accepts the responsibility for a multiplicity of evaluations and judgments concerning the educational achievement of graduates in preparation for entry into the profession of architecture. The principal subject of such evaluations is the professional degree programs of the qualified universities and institutions nationwide. (NAAB, 1995, P. 5)

Further to its evaluating function, the NAAB also develops services to assist schools of architecture in fulfilling the requirements of the architecture profession, as required by its collateral bodies, the AIA, the ACSA, and the NCARB. It has developed a list of achievement orientated performance criteria (competency statements) that guide schools in the development of curricular frameworks (Bunch, 1993).

The NAAB publishes its Conditions and Procedures, which contains the current accreditation requirements for schools, and uses performance-based educational criteria to recognise architecture schools as fulfilling these requirements. The NAAB further identifies cases of educational excellence which it encounters on its accreditation visits, and keeps its collateral organisations informed about these.

The Board has committed itself to the use of accreditation criteria and procedures that are valid and reliable for their purpose. These criteria and procedures are updated annually to take account of changes in the profession of architecture, and there is a validation conference held every three years attended by interested parties. At these conferences such issues as changes in the NCARB's examination specifications, the results of surveys amongst the members of the various profession bodies, and so on are discussed. There are two annual meetings of the NAAB President and staff with the Presidents and representatives of the ACSA, the AIA, the AIAS, and the NCARB, known as the Five Presidents Council. In this way the various professional architecture associations in the USA can keep in close contact and can report on and discuss any matters related to the well-being of the architecture profession or any matters of mutual concern to all or several members of the Council.

The NAAB sums up its activities in this way:

> In summary, NAAB exists to assure the maintenance and enhancement of an appropriate educational foundation for the profession of architecture, the aggregate national effect of which will assure the maximum opportunity for success of the aspirants to the profession and, ultimately, a profession known to be both qualified and excellent. (NAAB, 1995, p. 6)

4.4.3 Professional Bodies in Egypt

There is in Egypt no dedicated professional architecture association. Architecture is affiliated to the Egyptian Syndicate of Engineering, which has no influence on the architectural profession or on architectural education as far as curriculum content, practical training, or validation (quality control) is concerned. The function of the Syndicate is rather to register engineers in the country, a category in which architects are classified. Upon graduation all engineers and architects are automatically registered. We have already noted what one commentator, Barrada (1986), has to say about the position (Section 4.3.3). He has this to add about the relative position of architects within the Engineering Syndicate:

> The Engineers' Syndicate is still governed by the powerful engineering section, which holds the majority of leading seats in its board. Laws and conditions of practice are, of course, biased in their favour. (p. 182)

Notwithstanding this bias in favour of engineers, the recognition of the Engineering Syndicate is something which, in the present situation, Egyptian architects are reluctant to let go. In an interview with the researcher in 1998 Rashed[10] states:

> One of the main reasons why we do not have schools for architecture is that if we have separate colleges of architecture, not departments related to the engineering college, we lose the recognition of the Engineering Syndicate. They have no role related to architectural education but from the practice side we are not allowed to practise the profession unless we register with the Syndicate. Also, once an architect has graduated from university he will automatically be admitted to the Syndicate and then officially he is an architect. After fifteen years, with the submission of your experiences and projects you have designed or where you have participated in the design process you then apply to be a consultant. But you have to choose between architecture, landscape, and urban planning.

Yet another architecture teacher, Serag[11] (interviewed 1998), sums up the inadequacies of architectural training in Egypt:

> There is much that is wrong with our situation. For one thing, architects are not fully recognised as a profession in their own right in Egypt. They are simply regarded both within the building industry and by the public as a type of engineer, and architecture is seen as a part of engineering. The public do not know what architecture involves, and in many cases neither do the students that we get to study architecture in our schools. This is not helped by the relationship of architects to the Engineering Syndicate, but the problem is that without the registration with the Engineering Syndicate architects would not be registered at all.
>
> What is really needed is a powerful professional organisation specially for architects, such as exists abroad. Such a body could work to raise the profile of architects in the country and to increase public awareness of architecture. It would also, ideally, contribute

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[10] Ahmed Rashed, assistant professor of Architecture, Asyut University.

[11] Mohammed A. Serag, practitioner and Chairman of the Department of Architecture, Al-Azhar University.

> to or even validate the architecture programmes in the universities and insist on a proper period of practical training as part of the route to the profession, perhaps with a professional examination. At present a student studies for four or five years, he graduates and is automatically registered with the Engineering Syndicate, and he can practise architecture. It is not good enough.

There also exists the Egyptian Architecture Committee, of which the teacher Rashed (interviewed 1998) says:

> There is also the Egyptian Architecture Committee, which has no effective role in practice. It is more a matter of a club or community where some conferences, lectures, or meetings are held.

The Architecture Committee, however, has in fact attempted to raise awareness of architecture amongst the general public. Bardah (1989) notes:

> In 1980 the Committee on Architecture within the Egyptian Supreme Council of Culture reached the conclusion that it was essential to develop a general awareness and appreciation of architectural values in society as a whole as a prerequisite for any improvement in the quality of architecture.
>
> Thus, proposals were made for measures such as awards, competitions, publicity and introduction of architecture in primary education. (p. 184)

In general, though, the Architecture Committee has had little influence. On the whole it is a toothless body more akin to a debating society than a validating organisation or an association which can fight for the place and status of the architect or have any effect on architectural education and training (Faramawi[12], interviewed 1998).

And Abdou[13] (interviewed 1998), another architecture teacher in Egypt, comments:

> Unlike many other countries there is no professional association to provide support for architects or to improve the standing of the profession. There is also no body which is concerned with the evaluation or quality control of the schools from the point of view of architectural education.

[12] Fuad A. Faramawi, Professor of Architecture, Ain Shams University.

It is clear, then, that neither the Egyptian Engineering Syndicate not the Egyptian Architecture Committee is a professional association comparable with those in other countries, including the UK and the USA, which protect and enhance the status of professional architects or ensure the quality of architectural education and training.

4.5 The Route to the Profession

In this section we will describe the route to the professional practice of architecture in the countries under study. As we have already seen, although it is still possible to qualify as an architect through office-based training, the normal path today for an aspiring architect is through university-based training.

4.5.1 The Route to the Profession in the UK

In the UK architecture is only taught as a subject at the higher education level, though some subjects taught at pre-university level, such as Art and Architecture History, and Craft, Design and Technology may be considered to cover areas relevant to an architecture course. Attempts in the last two decades to address this situation by increasing awareness of the built environmental in Britain's schools have met with limited success, although some colleges in the further education sector have offered for a number of years technical subjects relevant to entry to courses in building-related higher education programmes. The RIBA has recently started a campaign to take architecture to the UK's school children, but any progress in this will take time (Louw, 1997).

Notwithstanding the differences between the education system, including the higher education system, of Scotland and that of the rest of the United Kingdom, the mainstream training of architects, whether academic or practical, is fairly uniform throughout the country. The training consists of a course of five years' duration or more, a style of course first introduced by the Architectural Association school in

[13] Osamah A. Abdou, Assistant Professor of Architecture, Misr International University.

London and the University of Liverpool, and its successful completion leads to the award of a degree. There is also a total of two years' practical experience in an architectural practice, the first year normally following the first degree and separated from the second by two years of postgraduate study. The validity of the five year course in architecture was challenged by the UK government on the basis of a 1985 EEC (as it then was) directive on architecture qualifications, in which it set the norm for architectural education in the Community as a minimum of four years. This was met, however, with a vigorous response from the RIBA, who set out their position in their paper 'Less Means Worse' (1990) and then in a steering group report on architectural education. The RIBA's arguments carried the day.

Entry to schools of architecture in the UK, as for undergraduate courses in any discipline, is through the Universities and Colleges Admission Service (UCAS), a centralised service for the whole country. For candidates coming straight from school and for those coming from a technical background there are certain minimum qualification requirements, and the RIBA in fact offers the recognised architecture schools guidance on minimum GCE entry requirements and their Scottish equivalents (RIBA, 1991), though schools are at liberty to be more demanding. Candidates over the age of twenty-one may be accepted if they have relevant experience, and overseas applicants, including those from EU countries, are assessed according to their individual qualifications. Architecture departments in some institutions also operate their own selection criteria, which in some cases may include a personal interview, or may include previous study of some relevant subject (Burston, 1995; Louw, 1997; Orbasli and Worthington, 1995).

As with undergraduate studies in other areas, undergraduate courses and students in the UK are partly funded by the state, with the Department of Education providing some finance for the schools. Other income comes from student fees and research.

The sandwich type of course (two degrees with a break for practical training) is universal in UK architecture schools, and this means in effect that there is a second point of entry into the second stage of the professional qualification. At this stage students are free to switch universities, move to another discipline, or leave the training path altogether. Admission beyond this level is usually a recognised architecture degree plus experience (Louw, 1997).

The path of the architecture course is a minimum of a total of seven years of study and practical training, with the normal pattern being (in England and Wales) the 3+1+2+1 pattern. That is, there is a three-year academic study spell followed by one year of practical training, then a second academic period of two years, followed by one year of practical training. The shape of the Scottish degree is different, so that the usual pattern there is 3+1+1+1+1, that is a three-year academic study spell plus a further academic year, followed by one year of practical training, one more academic year, and a second year of practice.

The first degree awarded, generally a B.A. or B.Sc. in Architecture brings exemption from the RIBA Part 1 Examination, and the second academic qualification, generally a two-year B.Arch. or a diploma, brings exemption from Part 2. The Examination in Professional Practice (RIBA Part 3) follows the final practical training period (Burston, 1995; Louw, 1997; Orbasli and Worthington, 1995).

4.5.2 The Route to the Profession in the USA

We have already given an account of the various professional associations relating to architecture in the USA and their relationships to each other (Section 4.4.2). In the USA the process of reaching professional architect status commonly takes anything from eight years upwards. The mainstream route is made up of five or six years in a school of architecture, and two or three years in an internship (as practical training is called in the USA), followed by a professional examination. The years as an intern are spent as a salaried office employee under the supervision of registered architects.

It should be noted that, despite the national validity of bodies such as the NAAB, autonomy in certain areas is still a feature of the individual states of the USA. Each state registers architects according to its own criteria, and there are some differences. As far as practical experience in concerned, to be entitled to practice architecture most (but not all) states of the USA require candidates not only to have a NAAB accredited professional degree and to pass an architecture registration examination, but also to complete a period of three years' practical training with an architecture firm. Thus, while it is possible to gain an architecture degree without going on to practical training, and while the practical training ('internship') requirements may vary from state to state, it is possible but very exceptional to become a licensed or registered architect in the United States without doing practical work (Bunch, 1993).

A five-year course in architectural training was first introduced in the USA by Cornell University in 1922, and this move was followed by most of the country's architecture schools by the 1940s. When the change took place to the so-called 'four-plus-two' course and other course models in the 1960s, some US schools retained their five-year B.Arch. course. The four-plus-two programme is a course involving a four-year study of environmental design or pre-architecture, leading to a non-accredited B.Sc. in Architecture or B.Arch. (or in some colleges a four-year humanities course leading to a B.A. degree) followed by an intense two-year period of concentration on architecture per se, leading to a M.Arch. degree. It is also possible in some schools to do a two-to-four-year M.Arch. degree with no preceding bachelor's degree. Although curricula may show some variation in content and emphasis from school to school, the monitoring and regulatory machinery of the AIA, the NCARB, and the NAAB ensures that both standards and content are controlled, as far as professional requirements are concerned. One-year master's degrees, often taken as 'higher' or research degrees, are not accredited degrees (Bunch, 1993).

4.5.3 The Route to the Profession in Egypt

As in the UK and the USA, the route to the professional practice of architecture in Egypt is through a university course, although, as we have noted above (Section 4.4.3) there is in effect no real practical training requirement in Egypt, and no professional examination for aspiring architects to go through.

Barrada (1986) gives this account of the entry requirements to Egyptian schools of architecture:

> Admissions to all universities are constrained by the total grades that a student gets in the Egyptian General Certificate of Secondary Education. Faculties of Engineering usually take the students with the highest grades from within the scientific and math sections. After the general preparatory year, students with the highest total grades are admitted to the departments of architecture.
>
> As all tests in secondary education and in the preparatory year in engineering test the ability to retrieve information and not learning or understanding methods or motivations (and this is a general problem of education in Egypt), it is students who are best at memorising information who are admitted to architectural departments. (p. 184)

The Egyptian architecture scene is also characterised by the lack of any information about architecture in pre-university education, or indeed any awareness of what architecture involves in the population as a whole. Barrada (1986) describes the position:

> There is a universal lack of any sense or awareness of the meaning or value of architecture. Society does not distinguish between good and worthless architecture. In some quarters even talking about architectural values is considered a luxury. According to a survey made by the Supreme Council of Culture in 1980, the word "architecture" does not appear in any educational text used at any stage of education. (p. 181)

Abdou (interviewed 1998), an architecture teacher in Egypt, comments:

> Unfortunately there is a general lack of information about what architecture is concerned with, even amongst students who seek to pursue a course in architecture at university.

And another Egyptian architecture teacher and practitioner Ibraheem[14] (interviewed 1998) makes much the same point:

> We find that students have little idea of what will be involved in an architecture course, or what architecture is about. This is because there is no understanding or awareness of architecture in the population as a whole.

[14] Mohammed A. Ibraheem, Practitioner and Associate Professor of Architecture, Ain-Shams University.

The total number of schools of architecture, or at least schools delivering some architectural training within architecture departments in Egypt, is currently 22. Of these 14 are in the 14 Egyptian universities, two are in fine art colleges, five are in private universities, and one is located in a military college (Rashed, interviewed 1998).

The length of the study period for a would-be architect in Egypt is usually five years, with one year being a preparatory year and then four years actually studying architecture. As we have already noted, there is automatic entry into the architecture profession in the form of registration following graduation (Section 4.4.3). There is no professional examination, and there is in effect no period of practical training, though a perfunctory period of so-called 'summer training' takes place; this period is largely nominal, and is not monitored by the school or any other body.

4.6 Academic Studies

Now that we have discussed the common routes to the architecture profession in the three countries we are considering, we shall look in more detail at the training of architects in these countries. The training consists in all three countries of a period or periods of academic study at university level and also a period of practical training to complement the academic study. The practical training in the UK and the USA, however, is of quite a different nature to that of Egypt. We shall begin by considering the academic studies in each country.

4.6.1 Academic Studies in the UK

Although the RIBA does not prescribe a curriculum for a course of architecture studies or lay down its content per se, it does nevertheless influence the curriculum content of the architecture schools through the RIBA Guideline Syllabus. This is reinforced through the Visiting Board and the RIBA procedure for the recognition of schools. The Guideline Syllabus as we have already noted is updated regularly (Section 4.4.1) by both educationalists through the Standing Conference of Heads of Schools of Architecture (SCHOSA) - the independent representative body of UK architecture schools - and practitioners through the RIBA. The Guideline Syllabus is considered by the RIBA to be the minimum core content of an architecture course of study in Britain, and in the early 1990s the Institute appeared at one time willing to enforce the syllabus nationally through the Visiting Board in order to satisfy government demands (Louw, 1995). In general, however, architectural education in the UK has been a mutually agreed system between practice and the academic world. As Louw (1996) states:

> The close association of architectural education with the profession has important advantages, the most obvious being its capacity for responding effectively to the needs of the profession. And the British schools have a very good track-record in this respect, producing graduates who are quickly absorbed into productive practice. (p. 299)

The RIBA Guideline Syllabus (1996) introductory section contains these words:

> The guideline Syllabus provides illustration and guidance on the content of courses leading to examinations in architecture at Part 1 and Part 2, and their relation to Practical Training and the Examination in Professional Practice. The difference in content between the Part 1 and Part 2 stages of the RIBA Examination provides a basis for the division in content of the two parts of recognised courses, contributing to continuity and flexibility of movement between schools.
>
> The Guideline Syllabus has been developed from a statement of RIBA Examination Principles, drawn up in the course of preparing for a revision of the RIBA Examination in Architecture, and with expectations which are applicable also, in terms of the expected body of knowledge and learning outcomes, to the Institute's Examination for its own independent office-based students. (p.1)

The Syllabus lays down five areas of study and a practical training requirement. These are:

- Architectural Design.
- Cultural Context of Architecture.
- Environmental Design, Constructional and Architectural Technologies.
- Communication Skills.
- Professional Studies and Management.
- Practical Training.

Part 1 of the course outlined in the 1996 Syllabus in general terms corresponds to the first three years of a full-time architecture course. The Syllabus takes account of technical and other developments by increasing the emphasis in some areas, including the development of the sustainable environment, an appreciation of health and safety concerns, and the provision of full accessibility to buildings. There is also a recognition that professional studies and management are of great importance and that they should be taught before the student leaves this part of his education.

In relation to architectural design the 1996 Syllabus states:

> Successful realisation of a design concept requires an ability to carry through design intentions using materials with a knowledge of their characteristics and performance, understanding principles of structure with methods of construction and finally developing an approach that is fully resolved through the detailed design of the building or project. Designers must be sensitive to the needs of clients, building users, construction workers and the community. (p. 7)

In relation to the cultural context of architecture the Syllabus states:

> Students should have working knowledge of the history of architecture and they should be encouraged to visit and experience buildings, to explore how they were built and originally used and how they have changed since they were built. (p. 9)

On the subject of environmental design, constructional and architectural technologies the Syllabus states:

> This subject group involves two interdependent areas of study, environmental design and architectural technology. The first examines the function of buildings. . . as a micro-environment. . . and the use of utility infrastructures. The physical principles of heat, light, and sound, and air movement and quality, together with the biological needs of human beings provide the knowledge and framework for decision making.
>
> The second area studies how buildings are made . . . a knowledge of the materials used and how they are used in construction. . . The appropriate choice of materials is based on a knowledge of their properties, their behaviour in use, mechanisms that cause failure, and their impact on health. (p. 11)

As far as communication skills are concerned, the Syllabus points out that these are a vital part of architecture, and that visual communication skill is an integral part of architecture as it is in essence a 'visual subject'. The Syllabus insists, however, that other communication skills, such as CAD, are needed too and that they should be introduced to the curriculum at an early stage. The Syllabus emphasises that students should not only be able to express themselves orally, but should be able to listen and understand. They should also have literary capability and be able to write clear reports and descriptions. The Syllabus also stresses the value of foreign language skills and of graphic and modelling techniques.

The Syllabus regards professional studies and management to be of great importance:

> Before the end of Part 1 of the course students should have obtained introductory knowledge of the issues which control the procurement and delivery of buildings. Generic management concepts, such as team working, time management, negotiating and decision making skills, may be introduced and given relevance through their practical application to students' project and course work. Students . . . should be introduced to the basic structure of the profession and the industry, the roles, relationships and responsibilities of the various members of the building and design team to the legal and regulatory concepts with which they subsequently become conversant. . . The organisation and management of an architect's office should be explained. . . . Visits to offices of different disciplines in the building team should be arranged, preferably linked with visits to sites to see work in progress. (p. 17)

The RIBA Guideline Syllabus regards Part 2 of the course as broadly corresponding to the two concluding full-time years of architecture study. It is concerned to develop a strong link between design, technical, and environmental matters with a practical grasp of professional studies and management. Part 2 acknowledges that for some students it would be wise to expand upon the foundation of design-based studies in order to produce for the architecture profession graduates of wider vision. Particular stress is laid upon the relationships that architects have with society in general, as well as with their clients and building users.

The Syllabus for Part 2 indicates that design and design-related studies are the core of the course and should form at least half the course time and student's assessment. Other courses should be seen as complementary to but not taking the place of core teaching or of the emphasis on design projects, an area in which all students should achieve high quality. Students should be encouraged in Part 2 to build on previously acquired skill by increasing their individual strengths and developing a portfolio showing their capabilities.

4.6.2 Academic Studies in the USA

As far as academic studies in the USA are concerned the NAAB, like the RIBA in the UK, do not prescribe a specific curriculum. They do, however, require certain minimum standards. These requirements are laid down thus (NAAB, 1995):

> A program must establish a general education requirement, for both admission to, and completion of the program.
>
> For five- and six-year programs, the following guidelines apply: a minimum of 20 percent of the total credit hours required for the completion of the program must be satisfied in liberal studies. Such courses would normally be taught outside of the department or school of architecture. The remainder of the curriculum should divided between required architectural courses to satisfy the performance criteria with a maximum of 60 percent, and electives to total a minimum of 20 percent of the entire required credit hours.
>
> For three-year programs, a minimum of 20 percent of the required credit hours must be in architecturally related electives.
>
> Three-year programs should ensure that at least 25 percent of the credit earned in each student's prior bachelor's degree was taken in liberal studies and, failing this, should make curricular provisions for the correction of the deficiency. (pp. 11-12)

These standards are enforced in the USA through the accreditation process.

A point to note is the specific insistence that a certain proportion of studies, whatever the duration of the course, should be devoted to liberal studies, in order to develop the architecture as a socially and culturally aware member of society.

As far as the professional component of an architecture course is concerned the NAAB describe the criteria required, but they do not lay down in detail the methods to achieve them. Rather the intention in setting out the criteria is to nourish the development of appropriate education which will fulfil the requirements of the architecture profession. The NAAB state:

> The education provided by a NAAB accredited program must ensure that its graduates possess the knowledge described by the achievement-oriented performance criteria . . . Collectively these criteria embrace the minimum body of knowledge and level of ability commensurate with the demands of an internship to registration for practice. (1995, p. 14)

The criteria are grouped under the headings of fundamental knowledge (social, environmental, aesthetic, and technical knowledge), and design, communication, and practice (project process, economics, business management, and law and regulations), and they are graded in terms of levels that students must reach upon graduation as follows: awareness (of basic facts, procedures, etc.), understanding (assimilation of knowledge, and the ability to analyse it and think critically about it), and ability (the skill to relate knowledge to the specific task in hand).[15]

The aim of the NAAB is to encourage an architecture educational environment which will ensure that architecture graduates are socially, environmentally, and aesthetically aware, as well as technically proficient and able to deal with communication matters such as client liaison and economic and administrative aspects of architectural practice (NAAB, 1995).

4.6.3 Academic Studies in Egypt

From our account of the historical background to architectural education in the country (Section 4.3.3) and from the fact that it has no effective professional architectural associations (Section 4.4.3) it is unsurprising to learn that there is no organisation that sets a minimum national standard or lays down national guidelines for architectural

[15] For a detailed description of the NAAB achievement-oriented criteria see NAAB, 1995.

education courses in Egypt. The curriculum content and the structure of each course in Egypt is therefore responsibility of the individual school.

Suwayeh (1985) outlines the academic study situation in Egyptian schools:

> Today there are 14 schools that offer architecture under the department of engineering, with a five-year curriculum culminating in a Bachelor of Science in Architectural Engineering as the first professional degree. This degree qualifies the graduate as an architectural engineer, with no additional examinations required before licensing. (p. 223)

As we have noted already, there are also eight other schools outside the universities offering architecture courses in Egypt (Section 4.5.3). Because there are no curriculum criteria as there are in the UK and the USA, we will use the curriculum content of the Department of Architecture in Ain Shams University in Cairo, the largest school in the country, as an example of an architecture curriculum in Egypt.

Ain Shams University runs a five-year course in architecture, in a department located within the School of Engineering, leading to a B.Sc. in Architecture degree. Admission to the School of Engineering is much sought after and therefore very selective. High school graduates may apply based on their grades. If accepted, the student will be admitted into the first, preparatory, year of general engineering. Successful completion of this part of the course will admit the student to the architecture part of the course.

The preparatory year consists of general studies with an emphasis on science, mathematics, and engineering. The second year sees the introduction of architectural and engineering related subjects, with an emphasis on architectural design and technical subjects, and averaging over 45 hours a week of teaching time. The Ain Shams curriculum is divided into four major areas:

1. Design requirements, making up some 36 percent of the total curriculum.
2. Technical requirements, which make up 33 percent of the total.
3. Professional requirements, 24 percent of the total curriculum.
4. Humanities and science requirements, totalling up to 7 percent of the curriculum.

No elective courses are offered in Ain Shams University or any of the other Egyptian schools (Suwayeh, 1985). There is no mandatory period of practical training monitored by the school in the Egyptian architectural training system.

Bardah (1989) regards the design of the curriculum in Egyptian architecture schools as unsatisfactory. He writes:

> Education favours the more specialised subjects like construction, technology, engineering. . . Very little emphasis is given to the humanities, the social sciences, art or culture even in the two architectural fine arts departments. More seriously, a state of fragmentation has been created, aggravating the difficulties of co-ordination and integration of the courses. Each subject in each year has become an independent island with its own methods and objectives. Accordingly, the students take the subjects as unrelated fields of knowledge, thereby losing any chance of understanding the wholeness of architecture. Certain general topics have been discarded, like the role of architecture in society, the responsibilities of the architect and understanding of the role of the total environment or the local environment. (pp. 183-184)

This criticism is echoed amongst the teaching staff at some Egyptian architecture schools. The teacher Ettony (interviewed 1998) comments:

> In terms of structure I would have to admit that there is a lack of integration in the curricula of our architecture schools. In all the schools that I know of subjects tend to be taught in an isolated way, without the relationship between the strands that make up architecture being sufficiently emphasised. The student therefore cannot view architecture as a single intellectual and aesthetic whole, and he is even less able to relate it to society in general.

When considering individual subject areas Bardah (1989) is also critical of the lack of stimulation in some of the teaching:

> The theory of architecture is usually combined with or taken as a part of the history of architecture in the twentieth century. Sometimes it covers types of buildings. It gives information and is not intended to stimulate thought, student involvement or appreciation.

Bardah (1989) also spells out the problem of constraints of time and student/teacher ratio in relation to the design studio:

> In all Egyptian schools architecture is taught in the "Beaux Arts " tradition of studio work. But, with the reduced time allocated for it and with the large numbers of students, it has become impossible to maintain the direct relation between the teacher and the student that is basic to that system.

Concern has been shown about the architecture programme in Egyptian schools, and recommendations on its improvement have been made. We have already mentioned the expression of concern made by the Architecture Committee as long ago as 1980 (Section 4.4.3). Bardah (1989) suggests that any proposal of the award of prizes and the introduction of architecture into pre-university school curricula should not be the only steps taken:

> This could be accompanied by appropriate changes in building laws and the organisation of the profession.
>
> The value of "learning" and the motivation to learn have to be developed very early on in general education, instead of just inculcating awareness of the importance of passing tests and motivating students to obtain a certificate. Students must be exposed to the humanities and culture. (p. 184)

Bardah (1989) adds that admission procedures to architecture departments need to be rethought, and proposes that steps should be taken to retrain teachers of architecture, to reduce the number of general course subjects in order to learn better those that remain. He favours relating architecture courses to the environment, seeking greater curriculum integration, shifting the focus of theory courses away from history and more to actual current architecture problems, and encouraging the student to develop his own capabilities in design. The type of individual actually teaching architecture and the entire question of the relationship of architecture departments to engineering faculties also, Bardah believes, merit long-term study.

4.7 Practical Experience

The practical experience of the students and the relevance of architectural education to the world of practice is maintained, in those countries where it is applicable, through different channels.

One such channel is the influence of professional bodies on the education of the architect. For example in the UK the regular review of the RIBA's Guideline Syllabus ensures the relevance of architectural education to the profession, as do the achievement-oriented criteria of the NAAB in the USA.

A further link with practice, at least in many countries, is that the teaching staff on schools of architecture are also practitioners. But perhaps the most direct tie between architectural education and practice is effective and systematic practical training. This link has been recognised as so important that some schools of architecture have developed the 'teaching office', which is similar to the teaching hospital, and it became popular during the 1970s and 1980s in the UK.[16]

One school of architecture to have a teaching office was that in the University of Newcastle, UK, from 1967 to 1987. The objective of this teaching office as stated by Charles Fox, its Deputy Director from 1967 to 1973, was as follows:

> The initial objectives of the Live Project can be summarized under the following headings:
>
> a) Relationship to Professional Practice in architecture: To focus academic attention on architectural practice and to show the effect of these elements in the design and management processes which could be simulated in a school situation.
>
> b) Relationship to the academic course: To provide a working architectural situation for practical demonstration purposes, both at undergraduate and postgraduate levels.
>
> c) Relationship to related disciplines (especially in the areas of Management and Applied Building Technology): To bring architectural students into working contact with other professions and people involved in the building process.

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[16] Similar experiences in the USA have been reported such as the University of Cincinnati co-operative education programs, Rice University's preceptorship program, the University of Oklahoma work/study program. At the Frank Lloyd Wright School of Architecture the student is apprenticed to a mentor who is member of the Taliesin Architectural Firm. Useful resources for the discussion of the teaching office can be found in these sources: Crosbie, M. (1995) "The Schools: How They are Failing the Profession" Progressive Architecture (September), pp. 47-51, 94,96.; Filson, R. (1985) "Architectural Education, Can Schools Span the Gap to Practice?" Architectural Record, Vol. 173 (No. 13), p. 59; Gutman, R. (1987) "Education and the World of Practice" Journal of Architectural Education Vol. 40 (No. 2), pp. 24-25.

d) At a later stage the Live Project was seen to have potential in relation to the work of the Building Science Section of the School.

e) Relationship to Research: To provide 'live' research vehicles for the postgraduate sections of the School (e.g. Building Science). (p. 7)

In the following sections we will look at practical training in the United Kingdom, the USA, and Egypt.

4.7.1 Practical Experience in the UK

Architectural education in Britain has a formal requirement of a total of two years of employment in the office of an architect or in the office of an architecture related profession, administered and partially monitored by architecture schools.[17] This has been an RIBA requirement since 1962. Schools are encouraged to assess the performance of students against stated learning outcomes. The students have a number of set areas to cover and this is controlled through a Practical Training Record (known as a log book) completed by the students, signed by the training office, and monitored by the school.[18]

A major impetus towards practical training in the UK came from W.A. Allen, who was asked in 1961 by the Board of Architectural Education to review the matter. He prepared a preliminary report and Elizabeth Layton was appointed to carry out a fuller investigation. Her report 'The Practical Training of Architects' (1962) can be summarised thus:

1. There should be integration of school and practical training throughout the seven years of training, the main responsibility for this to be with the schools.

[17] Students can also chose to spend part of their experience in an office overseas, but if a period is spent abroad then the RIBA insist that arrangements should be made to have it properly supervised according to their standards.

[18] The log book (properly called the Practical Training Record) which keeps a record of a student's activities will normally be signed monthly by the student's supervisor and by the appropriate member of the architecture school's teaching staff. Its purpose is to act as a check list for both student and supervisor to ensure that as full a breadth of experience is given as possible. It will also show the Professional Practice examiner the extent of a candidate's practical training.

2. There should be a wider range of practical training with other members of the building team.
3. Training in architecture offices was to be more effective.
4. There should be management courses introduced.
5. The Part 3 examination was to be a more rigorous test of the architect's capabilities.

Following this report practical training became an RIBA requirement.

Edwards and Blacoe (1996) explain the RIBA's stipulation:

> Students wishing to qualify as architects in the UK are required before sitting the final examination in professional practice (Part 3), to gain professional experience in accordance with the RIBA practical training scheme. This scheme requires a minimum of 24 months' experience after entering a recognised course in architecture. At least 12 months must be after gaining RIBA Part 2 exemption and a minimum of 12 months must also be spent in the UK under the supervision of a qualified architect. It is usual for the experience to cover two periods, the first typically following a three year degree course leading to RIBA Part 1 exemption and the second following a course leading to RIBA Part 2 exemption. (p. 8)

As far as the supervisory role of the school in practical training is concerned the Architect's Handbook of Practice Management (1991) describes the position of the member of the school's teaching staff who monitors the progress of students undergoing practical training:

> Each school of architecture has appointed a member of staff as a Practical Training Adviser who can cooperate with employers in a joint effort to secure the best training possible for students. . . The Adviser, whose main aim is to help both employer and student on all aspects of practical training, is normally well qualified to comment on such matters as salary levels and student capabilities. Most Advisers have other responsibilities in their schools, but they will try to visit the office at least once during the year. (p. 29)

The Practical Training Adviser will keep in touch with the practice Office Supervisor throughout the student's practical training placement.

Obligations are laid upon offices which offer practical training, and practitioners agree to do the following:

- To give a student a reasonable opportunity to gain the experience set out in the Practical Training Record.
- To appoint an experienced individual (known as the Office Supervisor) who will personally direct the student's work so that proper experience is gained.
- To allow periodic visits from the appropriate school staff member to monitor progress.
- To allow up to ten paid working days per annum for professional activities which have the educational objective of enhancing the student's practical training (RIBA, 1991).

For their part students are advised by the RIBA (1995) to take part in or at least observe the following: meetings with clients, including discussions of the brief, procurement, and project drawings, site investigations and meetings with officers of statutory bodies, preparation of drawings, specifications, and schedules, meetings with other building team professionals, dealing with contracts, site visits, post-completion procedures, and other office procedures and organisation.

The RIBA clearly see practical training as an indispensable part of the route to professional practice, and as a complement to academic study. It is intended to make sure that those becoming architects have a practical understanding of the legal and contractual matters relating to the profession of architecture, to ensure that they have direct experience of the practitioner/client association, both in terms of legal obligation and as regards ethical working relationships, and also to give them day-today supervised experience of the conduct of business in an architecture office.[19]

[19] In a research study conducted by Edwards and Blacoe to examine what students think is learned in the year out, it was found that students think that nearly 40% of the total learning attainment which is expected in full-time education is achieved during the year out (Edwards, B. and Blacoe, R. (1996), 'Work-based Learning in Architecture', International Research and Practice: Bridging the Gap. Thirteenth Inter-school Conference on Development.

4.7.2 Practical Experience in the USA

In the USA the period of practical training is called an internship, and a three-year period of such training is required before an architecture student can sit his registration examination. This period was formerly characterised by not being organised either by the profession or by the architecture school. It was not until the 1970s that, in an attempt to regularise this period of practical experience across the whole United States, there was developed the so-called Intern-Architect Development Program (IDP). The IDP was set up in 1975 by a joint programme of AIA, NCARB, ACAS, and AIAS to fill a perceived gap in the training of architects. Wiese (1984) writes of

> the internship "gap" wherein most aspiring architects disappeared for several unaccountable years between completing their education and applying to take the registration examination. (p. 57)

The programme is described thus by the IDP Coordinating Committee (1986):

> The Intern-Architect Development Program was designed to provide a framework for this internship interval in architecture by making available to the motivated intern a program of training, supplementary education, and advice and counsel that would promote effective and comprehensive preparation for the profession. The establishment of uniform internship requirements was also intended to assist the practitioner in the training of competent, versatile, committed employees; to provide state registration boards with an easily administered standard against which the experience of those seeking entrance to the professional examination could be measured; and to benefit the profession generally through the development of broadly experienced and knowledgeable architects whose progress through internship would be guided by the best advice the profession had to offer. (p. 49)

There are 14 'Core Competencies' to be covered in the IDP programme, and an intern must have some exposure to them all. They are: programming and client contact, site and environmental analysis, schematic design, building costs analysis, code research, design development, construction documents, specifications and materials research, documents checking and co-ordination, bidding and contract negotiation, construction phase (office), construction phase (observation), office procedures, and professional activities (Wiese, 1984).

The IDP is perceived to be particularly strong because of its comprehensiveness. We have already noted that it embraces three major training categories. IDP, however, is not a compulsory part of architectural training in the USA, but at the time when Wiese wrote (1984) an increasing number of states were adopting the IDP training criteria to use in their own evaluation of an examination candidate's experience. Wiese looked forward to the time when all states would do this, guaranteeing aspiring architects the same treatment in whatever part of the USA they were located.

One problem with the IDP has been that the very fullness of the experience that it offers has deterred some architecture offices from offering it, partly because they may not feel able to provide experience in all areas. Wiese (1984) again:

> The Coordinating Committee . . . recognized that it is not always possible for every intern in every form to sail through all of the 14 areas of exposure which comprise the three training categories. . . . Sometimes the opportunity to do a certain kind of work isn't available. So the Committee has provided two other means of gaining exposure. One means is through an old and honored learning method – observation. When an intern cannot actually perform a task he or she can at least learn from watching how it's done.. . .The other kind of acceptable training exposure is through *supplementary education*. (p. 59) (Italics in original)

Wiese (1984) identifies further grounds for the reluctance on the part of architecture offices to participate in the IDP to be financial, but whatever the reason for hesitation on the part of the profession it is (or was) a reality. Wiese (1984) writes:

> It is an unwelcome fact that while we now have in place the most fully realized internship system ever developed in this country, our profession has thus far been uncharacteristically sluggish in making it work. (p. 57)

The IDP Coordinating Committee itself has recognised the difficulties it initially faced in getting the system underway. In an article in the Architectural Record in March 1986 the Committee writes:

> It hasn't been easy. The committee, created in 1975, found its task of establishing a standard for the internship interval in architecture very much of an uphill battle. . . While the profession has supported standards for the accreditation of its academic curricula since 1940 and has utilized a uniform examination since 1962, it has consistently resisted efforts to prescribe standards which will ensure that those seeking entrance to the profession will have a

> comprehensive exposure to architecture's body of knowledge during their internship, the critical link between academia and practice. (p. 49)

The Committee suggests that one reason for this reluctance to take up the new system by the profession was that it represented a challenge to the practice of hiring interns with a view to the economic interests of the firm rather than to the advantage of the intern and, in the long run, the profession as a whole. It was also seen by some practitioners as spoon feeding graduates whose lack of skills was already a matter of comment to some in the profession. (IDP Coordinating Committee, 1986)

4.7.3 Practical Experience in Egypt

There is comparatively little that we can add in this section to what has already been written about architectural education in Egypt. We have already noted that there is to all intents and purposes no real practical training in the country. There is a period referred to as the 'summer training', but it is perfunctory and unsupervised (See Sections 4.4.3 and 4.5.3.). The practitioner and architecture teacher Ettony[20] (interviewed 1998) has this to say about it:

> The so-called 'summer training' is of no value. It only lasts four weeks and is in any case unsupervised by the school. The student does not gain anything by it at all.

He also points out that this means there is no practical test for architects' admission to the Engineering Syndicate: 'There is no practical experience required for the Syndicate.'

There is an awareness in the profession and amongst the teaching staff of Egypt's architecture schools that the situation is unacceptable. Serag, the chairman of the Department of Architecture at Al-Azhar University, states:

> Practical training is important and we need a practical training system in Egypt because it is an integral part of the initiation process of an architect. (Interviewed 1998)

[20] Sayed Ettony, practitioner and Professor of Architecture, Cairo University.

Another Egyptian architecture teacher (who is also a practitioner – a combination which is permitted in Egypt) states:

> There is not until now a mechanism for quality control of Egyptian graduates. Hypothetically it should be a matter of training within one of the biggest consultant offices in Egypt or a construction company, and that will be after the second and third level of the programme, which is called summer training. But unfortunately this is not the case. (Said[21], interviewed 1998)

Faramawi (interviewed 1998), an architecture teacher, comments:

> There is in reality no quality control of graduates, or any means to ensure they are ready to do professional work when they graduate. The period of summer training is only a few weeks, and it is not supervised in any way, so that it has no practical value. There is no doubt that graduates leave school with a large gap between what they have been taught and what they are required to do in practice.

4.8 Quality Control

Having completed our account of the educational and other training processes that form the route to the profession in the UK, the USA, and Egypt, we now turn our attention to quality control measures over both academic training and practical training in those countries.

4.8.1 Quality Control in the UK

As far as the academic side in the UK is concerned the quality of courses is monitored by the academic staff appointed by the university and by external examiners who are drawn from other academic institutions and from architectural practice. As in other academic disciplines the external examiners ensure parity with other schools. Each school has an Examination Board, which validates marks awarded and controls the

[21] Salah Z. Said, practitioner, Professor of Architecture, Dean of Misr International University's Faculty of Engineering, and vice-president of the International Union of Architects.

progress of students through their courses. While institutions do not lay down curriculum content, they do oversee both course content and structure through Boards of Study (Louw, 1997).

The architecture profession plays its part in the control of architectural education quality largely through the inspections carried out by the ARCUK/RIBA Visiting Boards.[22] (See also Sections 4.4.1 and 4.6.1.). The ARCUK and the Education and Professional Development Board of the RIBA appoints a Validation Panel comprising both practitioners, architecture teachers, and students and Visiting Board teams are drawn from this Panel. Louw (1997) describes the procedure used by the Visiting Board:

> The Visiting board bases its recommendation whether or not to grant recognition for a particular education programme on its finding on the day, judged against a given set of criteria . . . as well as information received from the school in advance. The latter includes a Self-Appraisal of the school as a teaching unit, a Questionnaire Return with specific details of resources and educational objectives plus all course documentation. During the visit the team sees samples of student work, written as well as design project work, and meets up with students, staff, external examiners, local practitioners and senior administrative staff from the home institution. Its final report goes to the relevant ARCUK/RIBA committee for approval and action, and then to the institution involved. (p. 298)

As we have seen above (Section 4.2.1) the system of visiting schools of architecture to assess quality and the achievement of standards goes back a long time in the UK, and more formally the RIBA Visiting Board was established in 1924.

Following a visit by the Visiting Board a report is prepared and recommendations are made on whether a course meets standards and therefore allows students exemptions from the relevant RIBA examinations. Where courses are judged to have maintained the standards sought, recognition normally continues for another five years.

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[22] The system is entirely independent of the government and is part of the UK system of giving full responsibility for professional standards of education and practice to chartered and statutory bodies.

This visitation system, combined with the responsibility of external examiners to make certain that the courses they examine are up to required standards, means that the profession of architecture has a much firmer hold on architectural education than the schools themselves. Some have criticised this as an 'official system' (Louw, 1997).

4.8.2 Quality Control in the USA

Quality control of architectural education schools in the USA, generally referred to as accreditation, is nowadays administered by the NAAB. Early attempts to control the quality of architectural education in the USA at a national level saw the adoption of the ACSA's 'standard minima' in 1914, and they remained in place until 1932. In effect, then, ACSA membership was tantamount to accreditation. Following the abandonment of the standard minima it was not until 1940, with the establishment of the NAAB (See Section 4.4.2), that there was a further attempt to accredit schools of architecture nationally. The NAAB is also recognised by the US Department of Education as having met the standards for recognition of specialised accrediting agencies in the United States. Accreditation is administered by the NAAB, who describe it thus:

> Accreditation signifies that a program meets an established standard of educational achievement. This achievement is ascertained by an evaluation process carried out by an accrediting agency. The accrediting process requires a self evaluation on the part of the institution and an external evaluation of the documentation by the agency, followed by a site visit and review conducted by a team representing the agency. (1995, p. 1)

In carrying out accreditation, the NAAB bears in mind the aims of architectural education, which it lays out in the following terms:

> As part of the entry into professional practice, education in an accredited program should ensure that all graduates have competence in architectural design, including technical systems and requirements and considerations of health and safety, that they understand the historical, human, and environmental context for architecture, and that they comprehend architects' roles and responsibilities in society. (1995, p. 1)

The NAAB originally set out to accredit the actual architecture *schools* of the country, but now the proliferation of architectural programs and the growing complexity of architectural education has meant that it is *professional programmes within schools* rather than the schools themselves which are accredited.

As far as accreditation procedures are concerned, the NAAB seeks evidence through documentation and review that all of the conditions that it lays down are being met. The conditions are a statement of the elements that the NAAB considers to be requirements of a professional degree programme in architecture, and an institution may only successfully petition for release from any of the conditions if it can show the NAAB that the aims behind the condition are being reached by some alternative means. The conditions include:

1. Regional accreditation.
2. Recognised Academic Unit.
3. Offering Recognised Programme Types.
4. Recognition of ethical responsibilities.
5. Self assessment.
6. Meeting curriculum requirements (NAAB, 1995).

The NAAB further seeks to ensure that the programmes in the institutions seeking accreditation or re-accreditation meet certain objectives, which include the location of the education in an institution that is recognised as being of a high intellectual calibre. The Association is also concerned that teaching takes place against a background that prepares the individual for ongoing personal growth, and institutions must show that they deliver to the students the skills to identify and analyse problems in architecture and to continue to develop these skills throughout their professional career. Because the practice of architecture is concerned with the production of buildings, matters of the health, comfort, and safety of users are paramount. The NAAB insists that accredited degree courses must ensure that architects are proficient in design which takes these concerns into account. They must therefore know about technical systems that will feature in buildings, and be made fully aware in their education about environmental and social aspects of architecture. The NAAB also emphasises considerations such as the architect's responsibilities to their clients and colleagues, so that accredited programmes must be able to show that they prepare the student to take account of the integrity and dignity of the profession of architecture, and understand the roles of related disciplines in the building industry (NAAB, 1995).

Institutions seeking NAAB accreditation or re-accreditation must also demonstrate evidence of sufficient human resources in terms of teaching numbers and support staff, and an acceptable staff/student ratio. They should also be able to show that they have the physical and information resources – sufficient studio space, library facilities, lab and teaching space, access to research facilities, and so on.

The NAAB, like its counterpart in the UK, carries out visits to the schools that are accreditation or re-accreditation candidates. The school's own self-assessment in the form of an Architectural Program Report (APR) provides the basis for an evaluation of evidence during the visit, and further information by the visiting team is gathered through documentation and interviews. Once accreditation for a school's programme has been gained it is maintained though periodic NAAB reviews (NAAB, 1995).

An NAAB visiting team usually consists of a chairperson, normally selected from among the Directors of the NAAB, and other members selected from amongst ACSA, AIA, AIAS, and NCARB nominees. The school is obliged to demonstrate with examples of student work that they are fulfilling each of the achievement-oriented performance criteria. A wide range of work must be shown, to cover the full range of taught areas and to show both high and low pass examples (NAAB, 1995).

4.8.3 Quality Control in Egypt

As we have already seen there are no effective professional bodies controlling architectural training or practice in Egypt (Section 4.4.3), and this lack means that there is no quality control over the education delivered in schools of architecture.

The Secretary General of the Egyptian Architectural Committee, Abo-Al-Naja[23] (interviewed 1998) also expresses his concern:

> At present, as you know, architects in this country are registered with the Engineering Syndicate. This has some advantages, but it

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[23] Sayf-Allah Abo-Al-Naja, The Secretary General of the Egyptian Architectural Committee.

> means that we have no separate organisational professional identity. The committee of which I am General Secretary is, to be honest, more of a talking shop than anything else, and we have no power to influence architectural education or to monitor the calibre of what our schools provide. There is no possibility, as things are, of the sort of quality control that operates in many other countries. We just do not have the mechanism to do it.

Faramawi, an architecture teacher (interviewed 1998) comments:

> Quality control of architectural training simply does not exist, except in that the universities seek a certain academic standard from all the students who are admitted and from the various departments. But there is no control by the profession, because there is no professional body to monitor quality either in architectural practice or in architectural education.

4.9 The Examination and Registration

Registration of architects, if not an actual registration examination, is now a common feature in various countries. The impetus towards giving architects official status and recognition was to a large extent a reaction to a challenge to their status as major players in the building industry and to the need for building control that began to emerge with the overcrowding of cities following the Industrial Revolution. Gutman (1992) writes:

> The movement to license or register architects developed early in the nineteenth century in England and America. Certainly by the 1850s architects realised that the design market was ready to expand in response to greater building production for an industrialising and urbanising society. The traditional class system could no longer be trusted to guarantee the architect's elevated role in the building industry. Licensing laws were needed if architects were to deflect he pressing claims of the building trades and civil engineers. (p. 4)

By the second quarter of the present century most western countries had a licensing or registration system set up. Gutman (1992), however, is not sure about the extent to which the laws governing registration have advanced the cause of architecture, pointing out that, at least in the UK, the regulations permit only licensed architects to use that title, but anyone can design buildings. On the whole, nevertheless, Gutman (1992) believes that registration statutes have been a good thing: 'It is likely that, without them, the profession would be more vulnerable than it now is.' (p. 4). And further:

> The licensing laws enhanced the self-image of architects and increased their respect among clients and the public. It [sic] also strengthened their hand in negotiations with others in the building industry. (p. 4)

We shall now look at the examination and registration procedures in the United Kingdom and the USA, and the registration procedure in Egypt (which does not have a professional examination).

4.9.1 The Examination and Registration in the UK

We have already noted some of the factors relevant to a consideration of professional examinations and registration in the UK. (See Sections 4.3.1, 4.4.1, 4.5.1, 4.6.1, and 4.7.1.)

Professional examinations leading to registration in Britain are under the control of the RIBA whose involvement in examinations goes back, as we have seen, as far as 1863 (Section 4.2.1). The RIBA examinations, following a 1988 restructuring, now consist of what is labelled 'The Examination in Architecture' (Parts 1 and 2) and 'The Examination in Professional Practice', which replaced the so-called Part 3 (RIBA, 1991).

The subjects of the RIBA Examination in Architecture (from which students who successfully complete the relevant course at a British university are, as we have seen, exempt) consists of Design Studies, Technical Studies, Cultural Context of Building, and Professional Practice.

The Examination in Professional Practice has the following elements:

- A documentary submission which will have at least some of the following: a professional CV, a practical training record, a professional training experience evaluation prepared by the candidate, a folio of professional case work..
- A written examination covering both job management and practice management.

- A professional interview designed to examine the candidate's knowledge and experience (RIBA, 1991).

The RIBA Guideline Syllabus (1996) states in relation to the Part 3 examination:

> The objectives of the Examination in Professional Practice are to test students for:
>
> - sound knowledge, skill and experience in the realisation of design and the procurement of building;
>
> - ability and experience in the organisation, administration and management of architectural practice;
>
> - sufficient understanding of the role of the profession and the construction industry in present day society. (p. 29)

In its <u>Architect's Handbook of Practice Management</u> (1991) the RIBA states:

> In assessing the competence of candidates, examiners will be interested in three things. First, the candidate's professional development to date; second, the ability to apply theoretical knowledge in practice as demonstrated by the candidate's answer in the written examination; and third, maturity as revealed in ethical attitudes and responses during the Professional interview. Candidates are expected to satisfy the examiners in all three aspects. (p. 27)

Successful completion of the Professional Practice examination leads to a candidate's registration and the entitlement to use the designation 'architect'. All candidates who are registered with the RIBA are automatically registered with the ARCUK, though not all who register through another route with the ARCUK are automatically registered with the RIBA.

Writing about the role of the architect with respect to the production of buildings Louw (1997) indicates the importance of the control of the profession in the form of registration:

> The vision of the professional architect demanded a high degree of autonomy, both from the client (regarding aesthetic judgement) and the industry (regarding physical and economic involvement with the actual building process). It presupposed expertise over a wide range of related subject areas being applied according to strict codes of conduct in return for a degree of security of employment and social prestige. The Registration Acts of 1931/8 confirmed the professional status of the architect in Britain along these lines,

> protecting the title but not the actual activity itself which remained subject only to building regulations and by-laws.
>
> Although the Architects' Registration Acts (which were amended in 1969) did not provide for a full disclosure of the profession they nevertheless gave the architects their first official mandate to operate as the professionals essentially responsible for the origination, design and supervision of buildings throughout the country. (p. 289)

4.9.2 The Examination and Registration in the USA

Because there are 55 registration boards that belong to the NCARB, qualification to sit the registration examination is not uniform in the USA. Nevertheless, most registration boards in the country require a degree from an NAAB accredited architecture school, and most also demand that candidates should also have completed the IDP (See Section 4.7.2).

Sitting the registration exam in the USA can be a costly business, as the fees vary according to the registration board concerned, and this may have had effect on the numbers taking the exam, there having been a fall of almost 50 percent in the numbers sitting nationally from 1985 to 1995 (Crosbie, 1995).

The NCARB registration exam itself is designed to test competence rather than brilliance, and concentrates on knowledge of the technical and other aspects that an architect needs to know. Since 1997 the examination has been set in a computerised format. Once a candidate has passed the examination he is registered with the NCARB, which entitles him to be registered with the AIA.

The exam is structured in ten divisions: Pre-design (A), Site Design - written/graphic (B), Building Design (C), Structural Technology - general and long span (D/E), Structural Technology - lateral forces (F), Mechanical, Electrical, Plumbing, and Acoustical Systems (G), Materials and Methods (H), Contract Documents and Services (I). All but two of these divisions are given in a multiple choice format; candidates answer questions by filling a gridded answer sheet. Site Design/graphic and Building Design are tested graphically.

4.9.3 Registration in Egypt

We have already commented that there is no professional association in Egypt which fills a role equivalent to that of the RIBA in the UK or the various professional bodies in the USA (Section 4.4.3). There is therefore no registration examination in Egypt, and upon graduation all architects are registered automatically with the Engineering Syndicate. As we have noted, there is an element of dissatisfaction with this situation amongst teachers and practitioners in Egypt.

4.10 Summary

We have in this chapter examined the part played by the changes that have taken place in the role and function of the architect in shaping the nature of architectural education, which can be seen as determined to a large extent by the reaction of those in control of the training to threats and challenges to the profession.

The study of three counties in particular, the UK, the USA, and Egypt, has thrown light upon the merits and deficiencies of different architectural training traditions, with some similarities and some points of contrast between them.

We have looked particularly at the historical background to architectural education in the three countries, at the role of the architect in each country, the part played by professional associations, and the typical routes to the practice of architecture which characterise the three systems. An account and comparison of the academic and practical training along with the quality control that is exercised over these has been provided, along with a brief description for each of the three countries of the professional examination and registration procedures (where applicable).

The chapter has indicated that although the education of architects is carried out in institutions outside practice in all countries, so that the education/practice gap exists, nevertheless there are strong links with practice in the UK and the USA, which go some way towards closing the gap. The successful links under these two systems are practical training, curriculum standards, examination, registration, and quality control. However, although these links are strong they cannot completely eliminate the gap, hence some dissatisfaction with current condition of the relationship between architectural education and its relation to practice. Thus, in noting the spheres in which professional bodies have taken a hand to shape architectural education, we have also noted the spheres in which it is felt, amongst architecture professionals themselves, that further steps need to be taken.

It is noticeable that in Egypt, where the training/practice links are largely missing, the gap between education and practice is the widest of the three countries. It is to some extent because of the strong influence of Egypt on architectural education in Saudi Arabia that the Kingdom displays in its system, in turn, most if not all of the shortcomings we have identified in Egypt, as we shall see in the following chapters.

Chapter 5

Architectural Practice in Saudi Arabia

5.1 Introduction

In looking at architectural education it must not be forgotten that it does not exist in a vacuum. However distant, in terms of relevance or practical applicability the subjects of its curriculum may be from the world of architectural practice, they are part of the overall architectural situation in Saudi Arabia. Notwithstanding the indisputable size of the education/practice gap, schools and practice must be examined in relation to each other. What practice does - or in the case of Saudi Arabia perhaps fails to do - affects what happens in the schools and affects the structure, content, and delivery of the curriculum. The comments of several respondents on the inadequacies of architectural practice are therefore especially illuminating. Indeed the suspicion with which the two sides, education and practice, sometimes view each other may conceivably be an indication that, when we consider the education/practice gap, not all is well in either camp.

Before discussing specifically architectural practice in Saudi Arabia, and in order to set it in context, this chapter gives a general overview of the country of Saudi Arabia in terms of history, geography, climate, demography, government, and socio-economic factors. A brief picture of the traditional types of architecture found in the four principal divisions of the Kingdom is provided.

This chapter then addresses architecture in Saudi Arabia, which can be conveniently considered under two main headings, traditional and contemporary architecture in Saudi Arabia.

The contrast between these two types of architecture, and the predominance of the contemporary style of architecture, leading to a change in the physical form of the environment, will be described against the background of the changing economic scene in Saudi Arabia.

We are also going to look at architectural practice, both the public and the private sectors, in Saudi Arabia. We shall examine this because interview respondents assert that reasons for the gap between architectural education and practice in Saudi Arabia lie in practice as well as in education. In order to substantiate this claim we will investigate the role of the architect in Saudi Arabia and the various agencies and bodies involved with architecture in the Kingdom, and examine the roles they have played in leading to the situation that prevails today, in which both architecture professionals and the people in general are dissatisfied with architecture.

5.2 The Country and Its People

When considering a study of architectural education and practice in Saudi Arabia it should be borne in mind that the state itself is barely 60 years old. The Kingdom of Saudi Arabia was unified in 1932.

Saudi Arabia occupies nearly 80 percent of the Arabian peninsula, and has an area of some 2,300,000 square kilometres (nearly 900,000 square miles) (Metz, 1992; Ministry of Planning, 1995). It is a kingdom of both coastal mountains and arid plateaux as well as vast desert sands and fertile oases. 'It contains the world's largest desert, Rub al-Khali (the 'Empty Quarter'), and perhaps the world's largest oasis, Al-Ahsa' (Harthi, 1987, p. 21).

Saudi Arabia is divided into four major regions. (These regions, however, do not represent administrative divisions of the country.) The four geographical regions are: (1) the Central Region (Najd); (2) the Western Region (Hijaz); (3) the Southern Region (ᶜAsir); and (4) the Eastern Region (Ahsa).

5.2.1 Climate

The climate of Saudi Arabia has had a major effect on the traditional architecture of the country (Section 5.3.1), and a failure to take proper account of climatic considerations has been a factor in the deficiency of contemporary architecture (Section 5.3.2). It is therefore important to give a brief description of the Kingdom's climate.

Most of Saudi Arabia has a year-round hot and dry climate, although the coastal regions, where the average daytime temperature is over 90° Fahrenheit (32° Celsius), tend to be humid during the summer. From November to April temperatures throughout the country are slightly lower than in summer. Indeed winter temperatures in parts of central and northern Saudi Arabia may drop below freezing at night.

The ᶜAsir region is the only part of the Kingdom that receives much rainfall. Summer monsoons cause an average annual rainfall of 12 to 20 inches. The rest of the country, however, receives less than four inches annually. Parts of the desert regions of Saudi Arabia may have no rainfall at all for several years.. A north-westerly wind called the Shamal causes frequent sandstorms in eastern Saudi Arabia. In the southern desert of Rub ᶜAl-Khali, the 'Empty Quarter', massive shifting sand dunes are very common.

The Kingdom has no natural rivers, lakes, or permanent streams of water. Low rainfall in most of the country necessitates irrigation, which depends mainly on underground water or sea water from desalination plants (Harthi, 1987; Farsi, 1989; Metz, 1992).

5.2.2 Population and Social Structure

As we shall see in Section 5.3.2 there is a wide belief that contemporary architecture in Saudi Arabia fails to take into account the social and cultural needs of the people, and has failed to respond adequately to demographic changes and to the demands of traditional values. It is therefore appropriate to sketch the demographic and social background of the country.

Estimates of the population holding Saudi citizenship have varied widely. Official figures published by the Saudi government indicated a population of 14,870,000 in 1990. In the same year, however, estimates by one western source inside the Kingdom were as low as 6 million (Metz, 1992). United Nations estimates were slightly less than the official Saudi figure. Based on the official Saudi figure, at the 1990 rate of growth, a population of 20 million by the year 2000 has been projected. The 1992 Saudi census indicated an indigenous population of 12.3 million people and a growth rate of 3.3 percent. In addition to the population holding Saudi citizenship, there were large numbers of foreign residents in the Kingdom. The 1992 census gave the number of resident foreigners as 4.6 million.

The composition of Saudi Arabia is far from being ethnically pure. Historically, Arabia has witnessed the influx of thousands of Muslim immigrants from almost all Muslim countries; some of these immigrants have chosen to settle in some parts of Arabia, especially in the holy cities (Makkah and Madinah) in Hijaz. Now some of them are Saudi citizens. Thus, the Saudi population is a mixture of Arab and non-Arab Muslim groups who share a common ideological background and cultural perspective (Faheem, 1982).

The family is the most important social institution in Saudi Arabia. Many families can trace their family records for generations within a tribal group. Members of the family are quite attached to one another and each feels a deep sense of responsibility for the family. For Saudis generally 'the family was the primary basis of identity and status for the individual and the immediate focus of individual loyalty, just as it was among those who recognised a tribal affiliation' (Stacey International, 1993, p. 41). Families formed associations with other families sharing common interests and life-styles, and individuals tended to socialise within the circle of these family alliances. Usually, a family business was open to participation by sons, uncles, and male cousins, and functioned as the social welfare safety net for all members of the extended family. While Saudi society has undergone significant transformation since the time it was a fully tribal nation, it is clear that social life in Saudi Arabia will continue to centre on the extended family. Family loyalty will continue to pervade all aspects of life.

5.2.3 Government and Politics

The government of Saudi Arabia takes the form of monarchy. The King is head of state and head of government. In Saudi Arabia the Quran is the constitution; thus, there is no other written constitution or elected legislature. Moreover, in Saudi Arabia, there are no political parties, trade unions, or professional associations. The Crown Prince is the Deputy Prime Minister, and other royal family members are heads of important ministries and agencies. The country's political system is highly centralised, with the judiciary and local officials appointed by the King through the Ministry of Justice and the Ministry of the Interior.

5.2.4 The Economy

An understanding of the economy of Saudi Arabia is critical for an appreciation of any of the Kingdom's contemporary aspects, including that of the architectural situation. It has been the rapid transformation of the Saudi economy, largely in connection with the discovery and exploitation of the country's oil resources, which has contributed so greatly to the development of Saudi Arabia in terms of infrastructure, educational requirements, urbanisation, manpower needs, etc.

An examination of the growth of the Saudi economy can indeed link boom periods within the general economic development with rapid growth in urbanisation patterns, the increased need for building professionals, and thus the expansion of architectural education within the Kingdom.

5.2.4.1 The Period before the Discovery of Oil

Prior to the discovery of oil, the economy of Saudi Arabia was very primitive. Saudi Arabia's primary source of income was the pilgrimages to Makkah. Next to that, agriculture represented the only other major economic activity in the country. The Kingdom was in a complicated state of underdevelopment with a rather low standard of living. Being dependent on pilgrimages and on small-scale agriculture, along with some minor trade, fishing, and nomadic herding, the economy was not self-supporting.

Nomadic tribes tended their herds, farmers and artisans lived and worked in a society of medieval simplicity, and there was no industrialisation, nor any effort toward it. Factors contributing to the depressed economy included geography, topography, and climate, combined with the socio-economic status of the country (Daghistani, 1997; Harthi, 1987; Ateshin, 1987).

5.2.4.2 The Economy after the Discovery of Oil

Oil was discovered in Saudi Arabia in the early 1930s. The exploration for oil began in 1934 and production in commercial quantities started in 1938. The Kingdom has the largest oil reserves in the world - approximately 261.2 billion barrels (Ministry of Planning, 1997) - representing more than a quarter of the world's known petroleum reserves (Metz, 1992).

Since 1970 Saudi Arabia, under the supervision of the Ministry of Planning, has developed six five-year development plans. Five of them, covering the period of 1970-95, have already been executed, while the five-year plan for 1995-2000 is still in progress. These plans have been designed to set in place mechanisms for the co-ordination and implementation of the programmes of individual government agencies and the private sector in the light of the increasing scale of development and the potential constraints put upon it by the inadequacy of infrastructural facilities and the shortage of manpower, as well as any temporary financial constraints which might at times dictate caution in setting the pace for growth (Ministry of Planning, 1997).

The period between 1938 and 1970 was characterised by some economic growth in the ten or so years following upon the commercial exploitation of oil, but it was limited by the Second World War, which inhibited the full development of Saudi Arabia's oil resources. Nevertheless, by 1948 the country's total revenues had risen to US $85 million, about 60 percent of it derived from oil exploitation, so that for the first time Saudi Arabia had some capital to invest in national development. There was still, however, little industrialisation or urbanisation, with the great majority of the population relying on a subsistence economy, and many of them still nomadic (Central Planning Organization, 1970).

Also in 1948 the first formal budget for the Kingdom was produced, and the next five years saw the setting up of the first local radio station, the completion of modern port facilities at Jeddah, the establishment of the first municipal electricity network (in Makkah), and the first formal higher education institute. In this period the first daily newspaper appeared, the country's infrastructure was improved by the completion of the Dammam-Riyadh railway, and measures to enhance the production of oil took place in the Eastern Region. By the year 1950 oil production had risen from 1 million barrels in 1938 to 200 million barrels in 1950 (Central Planning Organization, 1970).

The later stages of this period before the First National Plan saw an ongoing expansion in the country's administrative network, and steady economic growth and overall development, but it was also marked by financial constraints due to the limited demand for oil, and the wars and political instability in the Middle East. The period saw steady development of the physical infrastructure of the country, along with its welfare services and manufacturing sector. The demographic and social profile was also changing in ways that were to have important ramifications for the built environment and for the construction industry, with many people beginning to move into cities and with the increase of urbanisation. Although the oil industry, both in terms of production and of estimated reserves, continued to grow, there was a slowing down in Saudi Arabia of its rate of expansion because of a lower rate of increase in demand and the availability of oil from elsewhere. It was in fact the slowing down of income from oil revenues that played a major part in the decision to set up and implement the National Five-Year Development Plans, which got underway in 1970 (Central Planning Organization, 1970).

The First Development Plan was a cautious but adaptable programme, aimed primarily at advancing the development of the kingdom's infrastructure, the improvement of public services, and the establishment of the administrative machinery to implement procedures and decisions. In the longer term the Plan's objectives included the nurturing of the nation's manpower resources through education and training programmes. The period covered by the First Plan saw a great change in oil income for the country. Not only did the government have an increasing share in the ownership of the oil sector, but there was an increase in oil prices and a change in the way they were to be decided - control moved from the international oil companies to the producing countries - as a result of actions by the Organisation of Petroleum Exporting Countries (OPEC) and the Organisation of Arab Petroleum Exporting Countries (OAPEC). The outcome was a vast increase in the price of oil, fourfold between 1971 and 1974. Not only did the unit price of oil increase dramatically, but Saudi Arabia's actual production of oil rose from 3.8 million barrels a day in 1970 to 7.1 million barrels a day in 1975. (Further increases saw it reach 9.5 million barrels a day in 1979, with some decrease and fluctuation in the years after that.). All of this was a tremendous boost to the economy of Saudi Arabia, making it very quickly one of the richest countries in the world, and setting the stage for potential rapid change. There was also, during the period of the First Plan, an increase in employment in the construction industry, amongst other sectors (Ministry of Planning, 1980a).

When the Second National Development Plan (1975-1980) came into force, conditions were quite different from the time of the start of the First Plan. Financial constraints were now fewer, and development was limited more by manpower and infrastructure considerations than by finance. The period of the Second Plan was characterised by heavy spending in the country's physical infrastructure and by expansion of the government administrative machinery. It also saw a continuing increase in the percentage of population living in urban areas, reaching 54 percent by 1980 (It had been 36 percent at the start of the First Plan.), a factor in the increased demand for building services of all types, including those provided by architects (Ministry of Planning, 1980b).

The thriving world oil market during the period of the first two National Development Plans contributed to an increase in Saudi government revenues from all sources from SR 5.7 billion (£0.95 billion) in 1970 to SR 211.2 billion (£35.2 billion) in 1980 (Ministry of Planning, 1997).

It was during the time of the Second Development Plan and part of the Third that development in the building industry peaked (See Section 5.6).

5.3 The Transformation of the Built Environment

In this section we will provide a general picture of the changes in the built environment which took place as a result of the economic development and its consequences in Saudi Arabia. A description will be given of traditional architecture and how it gave way to contemporary architecture under the influence of economic change and urbanisation.

5.3.1 Traditional Architecture

Although there are comparatively few buildings standing which are more than two hundred years old, within the four regions of Saudi Arabia, Najd, Hijaz, Asir, and Ahsa, there are nevertheless many typical examples of the traditional architecture styles of Saudi Arabia. Until the recent changes in the country in the wake of the discovery and exploitation of oil, there was little impulse to change traditional architecture styles, so that traditional buildings that are only a generation or two old are characteristic of old designs and methods. There are four main styles of traditional architecture, typically found in the four main regions of the country (See Fig. 5.1).

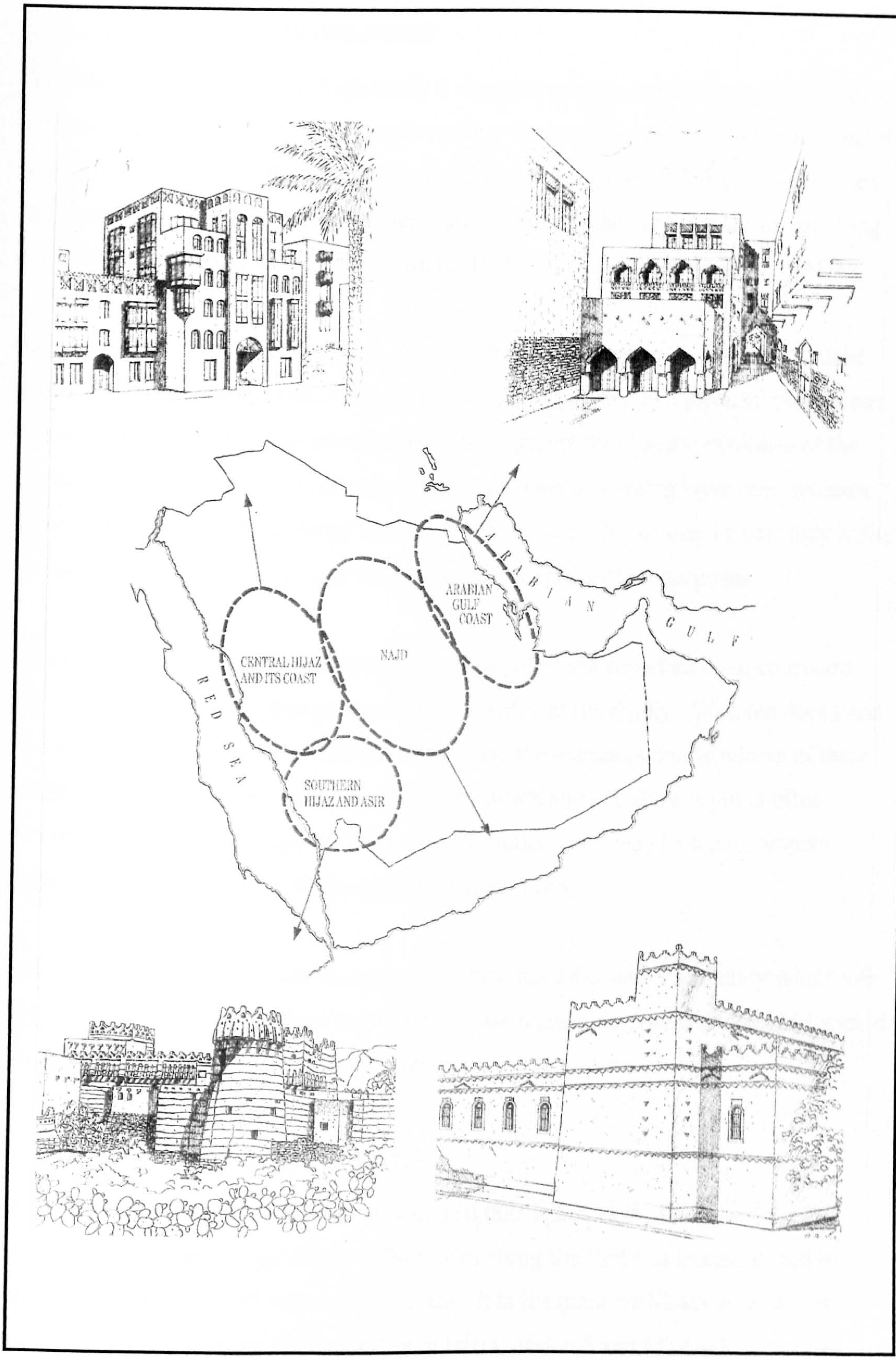

Fig. 5.1: Architecture Regions in Saudi Arabia (Source: Fayez, 1988).

1. The Central Region (Najd)

The Central Region or Najd ('high land') is elevated country at the heart of the Kingdom with an estimated area of 600,000 square miles. At its centre is the royal capital and the country's principal city, Riyadh. In the last thirty years, Riyadh has been transformed into a modern city and a growing commercial centre. Today, it is the fastest-growing city in the Middle East (Harthi, 1987; Metz, 1992; Ministry of Information, 1997).

As for the architecture in this region, the main traditional building material is unfired mud-brick, with the completed walls being smoothed by the application of mud plaster. The walls are very thick, and provide protection against the climatic extremes of the region. Mud is also used in roof construction, forming a covering layer over wooden beams with palm matting or twigs spread on top of them. Stone plays a part only in the foundation of buildings or in their strengthening for fortification purposes.

Houses, which may have several storeys, are typically built round an open courtyard with few street openings, thus preserving the privacy of the family. Wooden doors and shutters, decorated with geometric patterns, close the entrances and windows of these buildings. House interiors vary, and the use to which any one floor is put is often dictated by how many storeys the house has. Exterior walls may be have parapets topped with crenellations of various types (Fayez, 1988).

Courtyards also feature in Najd in mosques, which have a covered sanctuary with roofs supported by colonnades. There are some regional variations even with the Najd area in the existence and size of architectural elements.

2. The Western Region (Hijaz)

The Western Region, or Hijaz, is an area of 150,000 square miles bordering the Red Sea. Its narrow coastal plain of about 700 miles along the Red Sea is surrounded by mountains on the sides not adjacent to the sea. It is the most well-known region of the country because it contains the holy cities of Islam, Makkah and Madinah, as well as Jeddah, the Kingdom's leading commercial centre and its former diplomatic capital. A fourth major city in the region is Ta'if, the summer capital of the Saudi government, chosen because its elevated location affords it a pleasant climate in the summer (Harthi, 1987; Metz, 1992; Ministry of Information, 1997).

A similar type of traditional architecture can be found in all of this region's main cities, a fact which may be attributed to shared effects engendered by the *Hajj* and by common commercial contacts.

Buildings in these cities are commonly two or more storeys high with flat roofs. The wooden-doored entrances are often vaulted, and the doors decorated with stylised carvings. There is further ornamentation on the wooden screens facing upper windows and balconies, and these screens also serve to preserve the privacy of the inhabitants, while allowing good interior ventilation. Their precise size and location in individual houses vary. Outer building walls are often whitewashed. The main traditional construction materials in this part of Hijaz are large quarried blocks of coral and other stones (Fayez, 1988). These houses typically have two outstanding features, the *Qa'a*, a public reception space with rooms organised around it, and the *Mashribiyah*, which is the intricate screen covering the opening on to the street, thus eliminating the intrusion into privacy.

In the southern part of this region, where the settlements are normally of village size, the traditional construction material is rough-cut stone. These settlements are sometimes positioned on hilltops, where a village fortification effect is afforded by the uninterrupted facings of the outer buildings. Rectangular towers with walls sloping inwards, featuring battlements and small apertures, are typical (Dakhil, 1985; Fayez, 1988).

3. The Southern Region (ᶜAsir)

The Southern Region, ᶜAsir, is located south of the Western Region of Hijaz on the southern coast of the Red Sea and has an area of about 100,000 square miles. This region includes the major towns of Abha, Khamis-Mushait, Jizan, and Najran. It is a relatively fertile area of coastal mountains whose peaks rise to 10,000 feet, with ample rainfall for cultivation. At the present time ᶜAsir is rapidly becoming one of the

Kingdom's summer resort areas, and the Saudi government is accelerating modernisation and agricultural development in this region.

As for traditional architecture, in the more northerly part of this southern region buildings can be found in mud, stone, or a combination of the two. The mud houses have horizontal rows of protruding stone slabs between each layer of mud in order to protect it from the dissolving flow of rainwater. Mud exteriors are often whitewashed, which serves to highlight the horizontal division of the buildings. Rectangular towers are often to be seen in village architecture, with inward sloping crenellated walls (Fayez, 1988). On the coastal area of the region there are still settlements with traditional circular brushwood huts (Stacey International, 1993).

4. The Eastern Region (Ahsa)

The Eastern Region, or Ahsa ('candy ground with water'), is its richest region as it contains most of the vast petroleum reserves. Located in Ahsa are the cities of Dhahran, Dammam, Khobar, Ra's Tanurah, Jubail, Qatif, and Hofuf. Dhahran is the site of the Arabian American Oil Company (ARAMCO) headquarters.

In this region, with its high humidity and its persistent oppressive summer heat, coral aggregate and wood are the traditional building materials, and buildings tend to be of a pier and beam construction with rubble infill and smoothed with white plaster. As in the Najd region palm thatch and wooden beams are used for the roof. As far as appearance is concerned no one particular style dominates in the region, though decorative arches appear in many different types of structure. There is an element of Persian and Turkish influence in the design, due to trade contacts through the Arabian Gulf (Fayez, 1988).

Buildings located on the coast are often designed to take advantage both of any cooling breeze and to take into account the generally cooler winter climate. Thus some buildings of several storeys feature small windows on the lower floors, where the upper floors have larger openings to increase ventilation (Dakhil, 1985; Stacey International, 1993).

5.3.2 Contemporary Architecture in Saudi Arabia

> The appearance of present-day cities in Saudi Arabia differs radically from that of the traditional cities, since the architecture and urban design introduced in the last forty years has brought in the use of foreign concepts, materials and methods, quite alien to the traditional patterns and techniques. (Bahammam, 1989)

We have seen how, before the discovery of oil, different regions of Saudi Arabia exhibited a rich vernacular architecture which developed in the hands of local builders using local materials and techniques. This traditional architecture, in contrast to contemporary architecture, satisfied the needs of the people, respected their customs and values, and was in harmony with climate.

The most important of the socio-cultural values that traditional architecture maintained was the privacy of the inhabitants of a house. In order to do this, the exterior walls of the houses were provided with very few openings, and in most cases the walls were shared between neighbours. With houses tending to be built around a central courtyard, all rooms looked inward to it and enclosed it. If there existed any openings in the ground floor they were either faced inward over the courtyard or were placed high to avoid the gaze of passers-by (Kilical, 1986).

As far as climate is concerned, the traditional answer to the hot dry harsh climatic conditions was to build close compact structures with few openings in the external surfaces and an orientation to the interior (Rowe, 1983). The living spaces were arranged around an internal courtyard. The larger external walls faced north/south rather than east/west, in order to minimise the amount of direct solar radiation received. Further, in an area of traditional houses buildings were close to each other and streets were narrow in order to maximise the parts that were in shadow and thus reduce the heat. Furthermore the choice of materials and the choice of colours also played a role in the traditional building. Because of their natural physical properties of low conductivity and high thermal storage capacity, mud, stone, and wood were the traditional construction materials; external surfaces were often white, to reflect the heat (Udschi, 1980; Aba-Al-Khail, 1979).

Upon the introduction of contemporary architecture a discontinuity with traditional architecture took place at many levels. Nowhere was this clearer than in the residential buildings and districts, where the villa replaced the traditional courtyard house, wide streets replaced narrow streets, and concrete and glass replaced mud, stone, and wood as building materials.

The serenity of traditional architecture has been eclipsed by a conglomeration of often hideous, or at best bland, styles (See Fig. 5.2). The realisation that has grown amongst architects, scholars, and the public as a whole that contemporary architecture has failed has contributed to an identity crisis within architecture in Saudi Arabia. This hardly needs to be underlined. It is, however, imperative to get across the issues perceived as the main factors in the failure of contemporary architecture in Saudi Arabia. Amongst these issues are the failure of contemporary architecture to respond to the socio-cultural needs of the people, its failure to respond to the climate of the country, and its failure to utilise successfully modern construction methods and materials. These issues pose serious challenges for architectural education and practice in Saudi Arabia. They are issues which need to be understood in order that it may become clear what type of architect, and thus what type of architectural training, are required in Saudi Arabia.

Architectural training in Saudi Arabia requires to produce the type of architect who is mindful of the cultural needs of the population. In effect, this means an architect who is aware of the traditional Islamic ethos which informs the customs and practices of the people, in particular the need for house design to be appropriate to family values, and whose awareness of these values has been enhanced by the type of education he receives. It means an architect who knows about the climate of the region for which he is designing, and who knows how to utilise materials and space to minimise the effects of an oppressive climate. In short, it means that architects should be trained according to Saudi values and usages, and that the measures of success should be Saudi rather than western, imported, criteria.

The negative aspects we have highlighted by no means apply to every building in Saudi Arabia, but they do apply to a considerable portion of the contemporary built environment. There are in Saudi Arabia buildings that have been conceived and erected at the highest standard possible; they are, however, the exception not the norm.

Fig. 5.2.1: Examples of the exotic styles introduced to the country during the construction boom.

Fig. 5.2.2: Examples of the exotic styles introduced to the country during the construction boom.

Fig. 5.2.3: Examples of the exotic styles introduced to the country during the construction boom.

As we have noted, one of the issues to which contemporary architecture has not successfully responded is the socio-cultural ethos of the people, the most important aspect of which is privacy. This can be seen clearly in contemporary residential buildings in Saudi Arabia, where the villa has become the preferred dwelling type. The introduction of the villa to Saudi Arabia took place during the 1950s and it became popular during the construction boom that started in 1974. Certain government initiatives, including building regulations as we shall see later in this chapter, made the villa the preferred dwelling unit.

A typical villa has two storeys and windows on all four sides. The traditional courtyard is replaced by domestic open spaces around the house, surrounded by a wall of two metres or higher built around the property line. This allows for the opening of windows and therefore the constant violation of privacy, which inhibits the full use of property by its owners. Hathloul (1981) points out that the introduction of the villa type of dwelling to Saudi Arabia may have been influenced by aesthetic considerations, such as an even alignment of buildings and the appearance of the streets. However, instead of the anticipated wide open streets with gardens on both sides, the actual result in Saudi cities was quite different. Fences were often erected on both sides of the street, and in the event of a house being overlooked by a high-rise building, these fences were often extended in height (See Fig. 5.3). In order to maintain privacy, moreover, overlooked windows and balconies are blocked or screened off by the use of plastic or aluminium sheeting (See Fig. 5.4).

Fig. 5.3: For occupants to maintain privacy, fences are erected around the house, and often extended in height.

Fig. 5.4: For occupants to maintain privacy, overlooked windows and balconies are blocked or screened off.

Quite apart from the privacy issue the introduction of the villa, with its open spaces around the house, inhibits the full use of a property by its owner in Saudi Arabia from the climatic point of view. Hathloul (1981) points out that front, side, and rear yards are undesirable spaces in a climate which is one of the hottest and harshest in the world. In a temperate climate, with a plentiful supply of water, such spaces can be easily maintained and utilised, but the hot and arid climate of Saudi Arabia does not permit this. Also the introduction of contemporary architecture has made cities less compact and means that buildings stand some distance apart, which leaves them directly exposed to the sun's radiation. In addition to this the excessive use of glass in contemporary buildings (See Fig. 5.5) and the unsuccessful use of reinforced concrete with measures such as heat insulation make houses and buildings unbearably hot. Consequently contemporary buildings rely heavily on mechanical devices and systems to provide the comfort in the climate which was afforded by traditional architecture (Bahammam, 1989). Even if contemporary buildings had not offended against traditional socio-cultural values, the use of modern building techniques and materials was bound to fail in Saudi Arabia, because of the constraints imposed by climatic considerations. The performance of contemporary architecture as compared with that of traditional architecture is summed up by one commentator thus:

> Consequently, although the contemporary house offers more in terms of living standards, the traditional house offers more in fulfilling the social and cultural needs of the inhabitants. (Kilical, 1986)

Even leaving aside the failings of contemporary architecture in relation to privacy and climatic requirements, modern building construction methods and materials have often been used poorly. Bahammam (Saudi architecture teacher, interviewed 1998) points out that in contemporary buildings there is often unnecessary over-use of structural elements, such as columns and beams, which in many cases are simply larger than required. Sometimes this factor is attributed to other reasons than the incompetence of the architect. In Saudi Arabia the building authorities will not pursue an architect if a building is ugly, or it displays poor use of internal spaces, but will pursue him if the building falls down. Understandably, then, architects sometimes take the easy option of ensuring that this does not happen in order to protect themselves.

Fig. 5.5: Examples of the extensive use of glass in contemporary architecture in Saudi Arabia.

Further, using reinforced concrete, concrete blocks, and aluminium and glass windows is the prevalent construction method. Yet even with contemporary materials this may not be the best way. Kamel (1998a) points out that in residential buildings the architect should consider other building construction methods such as load-bearing walls, which is 20 – 30 percent cheaper, is faster, and is aesthetically more pleasing. In public buildings, too, reinforced concrete is sometimes not the best material, especially in Makkah, Madinah, and other places where land is so costly in the central areas. In such areas using reinforced concrete means massive supporting columns, whereas steel structures take up less space and thus cost less in terms of land utilisation.

Nuwaiser (1991) points out in this context that the use of non-traditional materials, such as aluminium and glass for windows instead of the traditional wood, means that these windows, in the first instance, cause the retention of heat and restrict ventilation, thus being out of harmony with the climate of the area, and in the second place they do not allow the preservation of privacy that is a traditional feature of Saudi homes.

Not only did the techniques and materials used in Saudi Arabia during the boom housing period fail to meet the socio-cultural and climatic needs of the people, and fall short in terms of structural efficiency and economy, but they were not specified or described or monitored in any systematic way. This had the additional result that it was impossible for schools of architecture to teach their students effectively about the nature and qualities of these materials, thus increasing the gap between education and contemporary practice. It is also an illustration of the lack of control in the acceptance of such materials into the country (Berkoz et al., 1989).

An additional factor to note about the architecture that has emerged in recent decades in Saudi Arabia is that it has been built in the virtual absence of any building codes and safety standards. Not only has this meant real concern over safety matters, but it is a further handicap to architectural education in that there is an absence of norms and benchmarks for teachers to hold before architecture students, and indeed an illustration that the gulf between architectural education and practice cannot always be blamed on shortcomings in training. Morkin et al.(1985) highlight the problems caused by the lack of codes and standards:

> The Gulf Cooperation Council countries have witnessed an unprecedented construction boom. The majority of construction in the Gulf has been built in the absence of a unified building code that regulates the building industry. The GCC countries are in need of such a code in order to provide standards that will ensure safety, and protection of property, and will maintain optimum conditions for a healthy environment. This Building Code should be relevant to socio-cultural values, and local environment, and should also take into consideration new scientific and technological advancement. (p.140)

With regard to health and safety regulations, an article in a Riyadh newspaper discussed the safety of houses which have metal bars fitted to close windows in the event of fire. This was mentioned to architects and engineers working in the city. The people who actually lived in the houses, and the architects, said that they felt that the houses were actually prisons and fire traps, and that the bars were not a safety measure at all (Faleh, 1989).

As a further example of the lack of adequate health and safety regulations comes from Johari (interviewed 1998), the Director of the Makkah Civil Defence (the government agency responsible for fire services). He stated that nowadays many high-rise buildings are being fitted with glass reinforced concrete (GRC) meshes on the windows to emulate the traditional *Mashribiyahs*. However, in the event of a fire it takes more than an hour to break these mesh fittings, and despite his pleas to the municipality to deal with the situation no action has been taken.

For the reasons stated above contemporary architecture is being rejected by both professionals and by the general public. As an indication of the failure of public housing, attention may be drawn to the so-called 'crash housing' projects in Riyadh, Dammam, and Jeddah, constructed in less than two years and completed in1978 (See Fig. 5.6). These houses, however, received a firm rejection from the Saudi people. In all three cities a large proportion of these buildings still remain unoccupied. As far as private sector housing is concerned many owners also 'rejected' houses in the contemporary style which they built themselves, by, for example, erecting barriers above the height of the surrounding walls or blocking windows and screening off balconies in order to preserve privacy. In this context, Jowair (1990) points out that Saudi Arabia has never really faced a shortfall in housing stock and seems unlikely to do so. In fact there is a surplus. The problem really is the low design quality of most new public and private housing.

As we have already commented, the exotic styles of contemporary buildings and their failure to satisfy the basic needs of the people in Saudi Arabia has generated a concern amongst educators, who feel a negative influence on the students. Indeed a Saudi architecture teacher has these comments to make about the contemporary architecture scene in the context of the training of new architects:

> When comparing architectural education in Saudi Arabia with architectural education elsewhere, we have to consider one important factor, and that is the nature of the surrounding built environment. In Saudi Arabia, unlike some other countries, there is no richness in the architectural environment immediately to hand to be observed in the cities. Traditional buildings have generally been demolished for development, and most of the contemporary buildings offer poor examples to imitate. So the students, while studying at the school of architecture, develop almost a schizophrenic mentality. They are asked to produce good designs, but they see only bad examples!
>
> Most of the dwelling houses lack aesthetic merit - in short, they are ugly! Functionally most of the houses I have seen display great waste of space, and the relationships between the internal house spaces are not always well thought-out. In some cases, for example, the kitchen is located a long way from the dining area. In another example I saw living rooms without windows, or any openings whatsoever, and depending entirely on artificial light. (Bahammam, interviewed 1998)

Further comments are made by another architecture teacher:

When I look at the result of practice in Saudi Arabia, the built environment, I find hundreds of buildings that I don't want my students to regard as models to learn from. (Ustankok, interviewed 1998)

Fig. 5.6: The crash housing project in Jeddah, completed in 1978 (Source: *Al-Bena*, 1979).

The general failure of contemporary buildings in Saudi Arabia has generated debate amongst architectural scholars and others. One theory maintains that the failure of contemporary buildings was inevitably a by-product of foreign architects who practised in Saudi Arabia and applied foreign ideologies as a stock in trade without fully understanding the environmental and cultural milieu within which they operated. Another theory is that it was the Saudi architects who brought back western theories after they had received their technical and theoretical training at western institutions. Others argue that Saudi-trained architects are to blame because architectural education in the country is faulty. Fadan (1983) argues that architects in Saudi Arabia are responsible for the current housing problem because they have failed to understand or consider the socio-cultural and environmental context within which they design. Gesair (1997) believes that the dilemma of contemporary architecture in Saudi Arabia is caused by the shortcomings of the architect in Saudi Arabia, which in turn is caused by the shortcomings in practical training, which ought to be complementary to academic training. He also blames the lack of a professional institution in Saudi Arabia, which ought to be monitoring practice and recording it for schools, so that they can teach accordingly. Gohary (1986), for example, claims that modern architecture in Saudi Arabia is in contradiction with traditional architecture. The responsibility for this contradiction, he argues, must lie with architectural education, which is no more than the western system imported into the country.

Regardless of who is to blame, whether the foreign architect, the Saudi architect, the building laws, modern building materials, or the practice as a whole, the fact is that all of the new architectural developments have turned the general public in Saudi Arabia against contemporary architecture, and they have started to hold architects and architectural education responsible. Although architects are not the only ones answerable for the poor quality of contemporary architecture in Saudi Arabia, they are the ones to get the blame because they are perceived to be liable, to be the actual building designers. There has resulted in a reduction of the credibility and status of the architect in the public eye. In fact it is not unknown for people to design their own houses rather than use an architect in Saudi Arabia, because they do not believe that architects provide the quality they require. However, generally these self-designed buildings are no better than those designed by architects, and indeed many of them can best be described as kitsch versions of western taste.

Indeed the low esteem in which those who provide design services are held is illustrated by the fact that municipalities have started to interfere with the design submissions. It is a generally accepted fact that in the building permit departments of Saudi municipalities it is common for the architects in the department to alter the submitted designs of their own accord, even although their duties are confined to ensuring that they meet building regulations and other standards. The researcher interviewed Hashim Attas, Director of the Department of Building Permits in Makkah, and asked him about this interference. He replied that this generally happened because it is the duty of the architect checking the design to verify that it conforms to the building regulations. Usually there is no interference when the design is of good quality, but in some cases it is found that the design is deficient in some way. Rooms, for example, may have no natural light, or they are improperly ventilated, or they do not maintain the privacy of the inhabitants, or there is great waste of space. In those cases the department officials, being trained architects, may become so frustrated that changes are made.

Although there is a clear body of opinion which is inclined to blame architects for the current state of architecture in Saudi Arabia, it will be advisable to look at architectural practice and how it is organised in the country before accepting that the blame lies with individual architects, and so in turn with the training they have received. The previous discussion has generated a set of questions which we shall deal with in the following sections. These include questions about where the building regulations come from, and how they were institutionalised, why the villa became the preferred type of dwelling, and why concrete and glass became the preferred building materials.

5.4 Institutions Concerned with Architectural Practice

In Saudi Arabia there are different institutions or groups of institutions involved with the practice of architecture. The first of these are the schools of architecture, which train architects, the second is the Ministry of Commerce Engineering Committee, the role of which is to give permission for architects to practise in Saudi Arabia, and the third group is formed by the city municipalities, which are the government agencies responsible for drafting building laws and for giving building permits to architects.

Finally there is the Saudi Omran society, which, although not a professional institution, is the intellectual forum of the profession. A brief discussion of each will follow.

5.4.1 Schools of Architecture

Saudi Arabia came to terms with its need for design professionals with training in the new technological aspects of construction during its period of transition from an underdeveloped country to a developing country following the sharp increase in oil revenues. The government therefore decided to set up schools of architecture (Jowair, 1990).

Architectural education in Saudi Arabia will be addressed more fully in Chapter 7. It will be useful in this section, however, to touch upon its socio-political context, since it is the architectural schools which train and produce architects, and since it is the nature of architectural practice in Saudi Arabia that is our present concern.

There are currently five schools of architecture in Saudi universities. It was the series of Five-Year National Development Plans which gave a boost to the establishment of most of these architecture schools in Saudi Arabia, since one of the elements in those plans was the development of the housing and the infrastructure of the country (as well as the development of education and training), and since there was a lack of architects and building engineers to meet this requirement. The first school of architecture had in fact been established within the College of Engineering of King Saud University (then Riyadh University) in 1967, before the introduction of the Five Year Plans, and the first generation of Saudi architects graduated in 1971. But the impetus provided by the development programmes and their need for more architects led to the setting up of four further schools of architecture, in King Faisal University (Dammam) in 1975, at the University of Petroleum and Minerals (Dhahran) in 1976, in the same year at King Abdul-Aziz University in Jeddah, and in 1983 at Umm Al-Qura University (Makkah) (Akbar, 1986).

All the schools offer a five year academic course, with a practical part (the so-called 'summer training') consisting of four to eight weeks in an architecture or architectural related practice. The students are allowed to practice immediately upon graduation, there being no registration or practice examination in Saudi Arabia.

5.4.2 Ministry of Commerce Engineering Committee

The Ministry of Commerce Engineering Committee was established by Ministerial Resolution No. 264 in 1982. It is the government authority that controls entry to architectural practice by giving permission to professional offices to practice. The conditions under which the Committee issues licences to open a professional office in Saudi Arabia are indicated below.

Licences for practice are issued for the following two categories: engineering offices, and general consulting engineering offices. Licences shall be issued for the following conditions:

- The applicant must be a Saudi national.
- The applicant must submit a written application testifying that he has not committed any immoral or unethical act which would jeopardise his practice.
- The applicant must hold at least a Bachelor of Engineering degree from a recognised university or college or from an Institute of Engineering, or an equivalent degree.
- The applicant must have practical experience with a licensed Engineering Office inside or outside Saudi Arabia or from any university or laboratory, or an equivalent experience with a government agency or a public or private organisation. The appropriate periods of experience are deemed to be as follows: three years for a Bachelor of Engineering; two years for a Master of Engineering or the equivalent; one year for the holder of a doctorate in Engineering or the equivalent.
- The applicant must devote his whole time to his practice.
- For a general consulting engineering office the practice must employ engineers from at least three engineering disciplines (Ministry of Commerce, 1982).

With this resolution the provision of architectural services, especially design, is not the monopoly of architects in Saudi Arabia; anyone with an engineering degree could open a consultancy office and carry out architectural design. Indeed the word 'architecture' is not even mentioned in the stated conditions. Permission may be given to any architects or engineers to practise architecture lawfully. Moreover, the registered architect, as this resolution stipulates, must devote his whole time to his practice, i.e. the licensed architect cannot hold a government post. That is to say, he cannot even teach. Further, in the aforementioned criteria there is no mention of registration examination or criteria other than the possession of a relevant degree to get permission to practice. Naim (1997) points out in an article in the *Riyadh* (No. 10561) newspaper that:

> The under-qualified architects trained by our schools of architecture are the chief source of the crisis of contemporary architecture in Saudi Arabia. Despite this, the Engineering Committee gives registration to open an office to anyone who is an architecture graduate without making sure of his quality first. Indeed there are no criteria to make such a decision.

There is, however, little public debate about this, owing largely to lack of public knowledge about the architecture profession. Architects may not be held in high regard, and they may often receive blame for buildings which they did not in fact design, but this is not generally known outside professional circles.

5.4.3 Municipalities

Municipalities, with the exception of the five large cities of Riyadh, Makkah, Madinah, Jeddah, and Dammam, which have a degree of autonomy, are accountable to the Ministry of Municipal and Rural Affairs (MOMRA). They are responsible for the construction and maintenance of public facilities in cities, towns and villages, and they carry out a co-ordinating role among government departments to ensure the provision of the basic services necessary for economic and social development and well-being. These include roads, water and sewage networks, markets, public service buildings, and stormwater protection structures. Environmental improvement and the establishment of gardens and parks are also within their remit. Municipalities are also responsible for issuing building permits and monitoring the application of building regulations.

The regulations in place in Saudi Arabia which relate to buildings are in the categories of setback, height, plot/building ratio, and zoning. The setback regulations dictate the distance that buildings must sit back from the front, rear, and sides of the plot (Ministry of Municipal and Rural Affairs, 1989). This may be contrasted with the traditional Saudi City, where all the buildings are more closely compacted together. Height regulations dictate that all the buildings in a particular area of the city must be of a uniform height, a factor that was controlled by cultural considerations rather than regulation in the traditional environment. The plot/building ratio regulations control the proportion of the plot on which building can actually take place. Regulations in this area were introduced in order to limit the density of buildings in any one area. This contrasts with the traditional cities, which are characterised by high density building. In the central areas of cities, however, it is still common to permit 100 percent of the plot to be built upon. Zoning regulations are intended to divide urban areas according to intended land use, residential, commercial, industrial, or whatever. Again, this contrasts with the traditional city, a characteristic of which is multi-use of land.

However, the regulations for which municipalities have responsibility as far as buildings are concerned consist, as we have noted already, of no more than four categories, and many scholars and professionals consider that they do more harm than good. Nuwaiser (1991) points out that the architectural regulations now in place in Saudi Arabia cover few areas and are unable to control the negative aspects of local architectural planning, residential land allocations, and utilisation of neighbouring buildings. Moreover, these regulations are a hotchpotch of conflicting views, without co-ordination. For example, some are translated from foreign sources, and some are introduced by varying government sectors with reference to the same instances independently of each other. Building laws in Saudi Arabia are only piecemeal, in some cases originally no more than ad hoc measures to deal with particular problems in a particular locality, but which have somehow got generalised all over the country. The introduction of setback regulations is the reason why homes in Saudi Arabia are now built with no interior space available for a courtyard, since the plot area that was previously allocated to courtyard use now has to be allocated to setbacks.

Writing about building laws and zoning regulations Hathloul (1981) states that those now being applied in Saudi Arabia 'seem to conflict not only with sociocultural values of its society but also with the physical and climatic conditions of its geography'. (p. 71) He adds:

> The zoning regulations presently being applied in Saudi-Arabian and other Arab-Muslim cities originated and developed in the late 19th and early 20th centuries in the context of a totally different value system – that of the United States and Western Europe. (p. 71)

Hathloul further observes that the setback and other regulations have not only been imposed on a culture in which they did not originate, but also that the milieu in which they originated is alien to the Arab-Muslim culture. To impose them on the Arab-Muslim culture, then, is by implication at least to impose the values that gave rise to them, which are at variance with the culture of the Islamic world. A similar point is made by Rowe (1983), who states: 'The result of using imported regulations in the development of communities can sometimes be alienating and often breaks substantially with established tradition.' (p. 68)

An illustration of this may be seen in an actual court case that took place in Bada'i in 1980. An owner, after faithfully following the setback regulations, was permitted by the municipality to open windows on the second floor of his house. His neighbour sued as this impinged upon his privacy, and the court ruled in the neighbour's favour. Thus there was a duality in the legal situation, with the building regulations clashing with traditional, and legally upheld, cultural practices (Hathloul, 1979).

As is pointed out by Hathloul (1986), the traditional process of interaction between the socio-religious structure and the physical environment within urban areas had now been replaced by another process guided rather by prescriptive conventions of form, a process alien to the environment and which worked against traditional cultural values and conventions.

A typical attitude to building regulations is illustrated by the architecture teacher Haikal (interviewed 1998) in response to the researcher's question about why the students are not asked to apply building codes and regulations in their projects. He says:

> I will tell you what I think, and I am sure this is the opinion of other teachers. Frankly, we don't trust these codes and regulations, and we are not convinced that they are correct. So we do not like to teach them as a constraint on design. In fact these codes and regulations are superficial. There isn't much to teach anyway.

> There is no building law other than height and setback regulations, which have had a negative impact on the built environment.

It is certainly the case that there are no systematically unified codes of building standards and specification in Saudi Arabia. However the mechanism for creating such codes exists in the Specification and Standards Organisation (SASO), established by Royal Decree number M/10 in 1972 as part of the Ministry of Commerce. Its function is to develop and promote standards, to approve the standards of other organisations, to apply the rules of quality marks and certificates of conformity, and to participate in agreed international bodies relating to such standards (Ministry of Planning, 1980b). However, although the SASO has been in existence since 1972 it has done little in the way of the introduction of new standards or regulations. The Ministry of Housing and Public Works (MHPW) also produced a handbook of standards and specifications, <u>The General Specification of Building Construction for Saudi Arabia</u> in 1983. However, this handbook is intended primarily for use by the Ministry's architects and, although it may be used by private practices if they wish, its use is not mandatory. What tends to happen is that each practice reverts to its own preferred standards and specifications. In response to a question from the researcher about what specifications and details are used in his office the practitioner Fayez (interviewed 1998) replies:

> For our working drawings, architectural details, and specifications we use the American code and standards. Since there is no Saudi code or standards, this was our choice. You have to follow some system, so we followed the American one.

The teacher Haikal (interviewed 1998) illustrates this problem:

> The dilemma architectural education is going through in this country is that practice is not organised. There is no written code, specifications, or details specifically for Saudi Arabia. Anyone can import any building material from anywhere in the world, and a contractor can start using it, without contravening any regulations. Professional associations in Saudi Arabia have only a limited role. They have no power over either practice or education. The role of the Saudi Omran Society is to hold lectures from time to time.

5.4.4 The Saudi Omran Society

The Saudi Omran Society was established in 1988. It was formed under the aegis of King Saud University, and is essentially of an academic nature. The Omran ('built environment') Society is not just an organisation for architects, but also for engineers, landscape architects, and planners who are involved with the built environment. Having its origins and essence in a university, it is in some sense a government organisation rather than an autonomous body. It does not, therefore, have the authorised power to act for the profession. Its goals are:

1. The development of the heritage of Islamic architecture through studying and analysing traditional architecture in Saudi Arabia.
2. Promoting a local identity of the built environment which is in harmony with the needs of society and relates to the climatic and environmental needs.
3. Fostering the exchange of ideas between the various specialist areas pertaining to architecture in the educational, governmental, and private sectors.
4. Cultivating the exchange of academic ideas relating to architecture both within and outside Saudi Arabia.
5. Research to promote the performance of the building professions (The Saudi Omran Society, 1995).

So the Omran Society is really like a professional club, not an organisation with statutory power. Its activities include hosting conferences, producing academic papers, running workshops, etc.

There is in effect, then, no professional body controlling architecture, including the training of architects, in Saudi Arabia comparable to the RIBA in the UK or the AIA in the USA. This fact is commented on by several of the interview respondents, most of those who mention it being of the opinion that the situation demands change. The teacher Fadan (interviewed 1998) is a typical example:

> There should be professional associations exercising a controlling role over two factors - practice and education. All the architectural training programmes in the country should be reviewed, evaluated, and accredited by the professional bodies.

5.5 The Role of the Architect

Architectural practice in Saudi Arabia is carried on in the public (or government) and the private sectors. We shall look briefly here at both.

5.5.1 Government Sector

Architects in government service may work either in universities or in government agencies such as municipalities or engineering departments. By far the more desirable of these is academic employment, firstly because university teachers have high prestige in Saudi society, and secondly because university teachers are open to receive scholarships to do postgraduate studies abroad. Those who work in government agencies may do administrative work or they may be involved in architecture design and construction. Work in this sector is considered more desirable than work in the private sector, and it would commonly be the first choice of career for a new architecture graduate. However, government sector positions are now scarce due to the numbers of new graduates, to such an extent that the period of compulsory work within this sector equivalent to the amount of time the student had spent in training, which used to be required of all new architecture graduates, has now been dropped (Bureau of Civil Service, 1995).

Architects working in the government sector, including university teachers, are not allowed to work in the private sector. However, unlike medical doctors in government employment, who receive a subsidy equal to 80 percent of their basic salary in compensation for not being allowed to open private clinics, architects and engineers in general receive no special treatment. Architects are also disadvantaged in government employment in that, unlike doctors, teachers, lawyers, etc., there is no special pay scale for them; they are simply on ordinary civil service scales, which of course means that they are more poorly paid than other professional groups (Bureau of Civil Service, 1995). This is a fact which is the subject of much comment (See Fig. 5.7).

Fig. 5.7: The employee says, 'How can I buy a new car? My salary is barely enough. I am not *cader* (able) to do anything.' (*Cader* in Arabic also means a group of people on one pay scale.)

In government work the architect tends to be involved to a larger extent in administration than is the case in private practice. This is an important factor, but, as we shall see in Chapter 8, it is one which architectural education has not yet addressed fully:

> The architect in the municipality does not work only as a designer but as an administrator, and the schools fail to prepare their students to work in the government, where all architects are involved in administration, such as report writing etc. (Attas, architectural practitioner in the government sector, interviewed 1998)

In municipalities, for example, an architect may be involved rather more in dealing with existing structures than with designing or supervising the construction of new ones. His day-to-day work may involve writing or commissioning reports on repairs required to current housing stock, for instance. In research conducted by two investigators, Edali and Tolah (1997), it was revealed that of 1,300 qualified architects working in the government sector, only 48.8 % actually practise as architects.

There are also large government sector architectural practices, such as that of the Ministry of Housing and Public Works. Here there are similarities with large private firms, with separate departments specialising in various aspects of the building process. Thus in the MHPW the Architecture Department does the design and the working drawings while other departments deal with construction, quality control, etc. (Sedairi, architecture practitioner in MHPW, interviewed 1998).

In a paper produced in 1992 the Deputy Minister of the MHPW, Zain-Al-Abideen, comments on the projects that are produced by departments of design in the government agencies. He states that the buildings produced are of low quality, that the designs themselves are repetitive and do not show any creativity, the drawings do not match, the architectural details are incomplete, the designs are inappropriate for the sites, the foundations are not suitable for the type of soil, the quantity survey is not complete, the specifications are not clear, and the standards of building materials are of poor quality and not durable. The projects also take a long time to complete, as there is a start-stop approach to problem solving in construction. Reasons for this poor performance include a poor working environment, unrealistic expectation of the agencies in terms of time, the isolation of government architects from new developments in the field of construction, the lack of architectural drawing standards in project documentation, and the lack of national specifications and standards. Zain-Al-Abideen (1992) points out that the MHPW has produced five handbooks as a step in the right direction. These are The General Standard for Project Documentation (1979), The General Standard for Quantity Surveying (1980), Handbook of Site Construction Supervision (1980), The Handbook of Reinforced Concrete Construction (1981), and 'The General Specification of Building Construction for Saudi Arabia (1983). He comments that perhaps other government agencies should follow those standards.

5.5.2 Private Sector

As we have seen in Section 5.5.1 the location of choice for many new graduates would be the government sector, and the scarcity of work in this sector is indicated by the fact that the period of compulsory work there has been abolished. However, this has had a knock-on effect in the private sector, so that the architecture graduate who works in the private sector may now be employed either in an architecture-related position or a non-architecture-related position, since there are not enough places within private practice for all of them to work as designers. This has meant that many who remain within the building industry diversify and find positions in estate agencies, in construction companies, etc. There are also many who are unable to find posts within the building industry at all, and have to do some completely different job quite unrelated to architecture.

There are two types of private architectural practice in Saudi Arabia, or at least two ends of the practice spectrum. One is the small practice, where an architect or an engineer has set up on his own with perhaps a civil engineer, a draughtsman, and another architect partner. In such practices, the architect, with the help of his small staff, normally does everything himself, from the initial meeting with clients, through the design stage, the architectural details, the working drawings, the cost analysis, the site supervision, and so on to the completion of the project, and all the administration connected with it.

At the other end of the scale there is the large practice (the architecture firm), sometimes part of a company with interests other than architecture. In such a practice there tends to be a hierarchical structure, and there tend to be many departments or sections. There might, for example, be a design department which hands projects on to a technical department after its part in them has been completed, and so on. In a large practice no one architect does all the things that architects do, so that there is a division of labour and specialisation, with some architects doing design, others handling client liaison, and so on. Indeed professional specialists in other departments may not even be architects, but electrical or civil engineers, etc., with whom architects must cooperate.

It is worth noting that, because of the lack of statistics about the relative numbers of small and large firms, architecture schools are to some extent handicapped in the planning of appropriate architectural education, since they do not know what proportion of students will be employed in what type of practice.

There are, of course, architectural practices which fall somewhere in between these two ends of the scale, and any one of them may happen to be to a greater or lesser degree structured and divided into specialist sections.

Several challenges to private architectural practices in Saudi Arabia may be noted here. One is a challenge from abroad in that, although foreign consultants are not now permitted to take commission on their own for work in Saudi Arabia without working in conjunction with a Saudi firm, they nevertheless take away projects that would have been handled by Saudis. Another challenge is the rise of the design-build firm, which offers to cut the cost for the client by eliminating the specialist design role of the architect. Although this is a new phenomenon in the country it seems likely in the future to constitute a real challenge to the standing of architects in the Kingdom. A further threat is that posed by the presence in Saudi Arabia of many foreign architects in private practice. These architects, who generally come from neighbouring Arab countries, are able to offer both a high degree of skill and are prepared to accept salaries much lower than their Saudi colleagues, which means that there are fewer Saudi architecture graduates in employment.

The basis of architectural fees varies from practice to practice, but in the case of most small offices a predetermined fixed amount is charged, paid as a lump sum, for the design or the design and the site supervision. With larger architectural firms the same arrangement may also be used, but it is commoner for a percentage of the actual building construction cost to be applied, and this is not known until after the process is completed. But it is one of the problems facing the profession in Saudi Arabia that architectural fees are declining sharply; this will be treated fully later in this chapter.

In Saudi Arabia, architectural projects are commissioned basically through direct appointment, for instance by a government agency, through competition, through bidding, or through personal contact.

Competition amongst architects is normally held to be advantageous both for the client and for the designer. However, in Saudi Arabia there are disadvantages in this type of architectural commission, because it is unorganised and is not controlled by any institution. One difficulty is that the client does not always hire the best jury to decide upon entries, generally because there is no person or body to whom he can initially go for advice about its composition. One other problem is that the client sometimes reneges on the payment of the any honorarium involved, again partly because there is no controlling body (Bukhari, 1992).

There are also some occasions when the full requirements are not initially given to the architect. For example one government body held a competition to design a government building. Although they asked for the designer's fee and that for the construction supervision to be included with the submission, the full requirements were not provided by the agency concerned. Another agency held a design competition, and then they took one of the designs submitted and gave the commission to complete it to quite another office. Another challenge to the competition system is the incompetent jury, who choose the winner on illogical grounds, such as that with the lowest quoted cost, instead of the best design. The problem in all of these is that there is no clear set of criteria to guide the client, the contractor, and the jury (Shoabi, 1992).

Fayez (1989) and Shoabi (1989) comment that one of the problems faced by their offices is that, when the government wishes to contract a building programme, adverts for tenders are placed in the press. There is nothing to stop any office, no matter the quality of its work, from submitting a tender. The government, however, tends to accept the cheapest although this does not mean the best quality. In effect there is no difference in the government bidding methods between those used for architectural services and those used for furniture supplies.

As far as direct commissioning is concerned in Saudi Arabia private clients may be found at some place on a continuum between two basic extremes. The first extreme is the type who looks for quality architecture, the other is the type who looks for cheap architecture. The first is the type of client who respects the architect as a professional, who values his work and who is looking for a good service and is prepared to pay properly for it. The second type is one who sees the architect as a necessary evil, someone to whom he has to go to get a certain type of service, but who is quite ready to make changes in the design of his own accord, and who is prepared to shop around to get the cheapest deal possible (See Section 5.6).

As for commission through personal contact, this is often made through relatives or friends who expect the architect to do the work very cheaply. This cannot really be done without cutting corners, and quality suffers.

As far as the services provided by large architecture firms in Saudi Arabia are concerned, the project typically goes through different phases. The inception phase includes the meeting of the architect with the client to ascertain his needs and his budget, and site investigation and study – incorporating surveying, soil examination, etc. The design phase includes the preparation of site plans, floor plans, elevations, and any necessary models and presentations, etc. The preliminary working drawing phase encompasses working drawings for floor plans, and for structural, plumbing, electrical, and mechanical installations, as well as for site plans. The final working drawing phase takes in further detailing of the preliminary working drawings, and also includes the preparation of bills of quantities and specifications. There then follows the tendering or bidding phase, where tenders are invited from contractors for the construction of the building. After the evaluation of tenders and selection of the successful bidder, there is the final costing phase, which is followed by the construction phase. In this last phase the role of the architect is to supervise the process in order to ensure that the building is actually being constructed according to specifications and according to schedule. The architect can also at this stage be involved in studying and evaluating sub-contractor bidding. He should also be prepared to do any further work on any of the previous stages which need to be revised.

In the case of small offices, Jowair (1990) points out that if a client wants to commission a professional office to do a design for a building, the procedures are as follows:

1. In their first meeting, the client and the designer engage in a dialogue and negotiate time limits, cost, and design. If they reach an agreement, the designer draws his client a preliminary design of the desired building at a scale of 1:100, consisting of a site plan, floor plans (first, second, etc.), facades, and sections. One of the office employees will take the preliminary design to the municipality to obtain approval.
2. After approval, the architect begins the architectural drawings (usually structural, electrical and plumbing drawings). After the completion of the whole set of drawings, the architect and his client meet again. At this time, the designer presents the client with three blueprint copies, as well as the approved preliminary design, and receives his fees.
3. The client takes one copy and the approved preliminary design to the municipality for approval by an architect and a civil engineer. If some changes are necessary the client will be asked to take the design back to the office. If not he will be asked to pay building fees calculated according to the total built area. Then the client receives a three-year building licence and approved copy of the final design. The preliminary design will be kept in the municipal archive.

Even though the time the above procedures might take differs from one office to another, those who sell reproductions of old designs require at least five working days. The professionals who design for each client individually take an average of three weeks to accomplish all of the above procedures.

Shoabi (1989) states that when architecture is discussed in Saudi Arabia the talk generally turns to the architect, and there is often a clash of opinion between those who believe that architects are doing a good job and those who believe that they are not. In most of the cases the architect is blamed for things he has not been responsible for.

He points out that there is a contrast between the quality of the projects emanating from different offices, and indeed even between projects emerging from the same office. In some cases the practice produces good quality work, at other times the work is noticeably inferior. This contrast is not limited just to the design concept, i.e. aesthetic considerations and creativity, which are largely subjective matters, but it extends also to the functionality of the project and the complementary architectural services. This causes conflict amongst the client, the consultant, and the contractor, and delays the work during its construction because the construction documentation is unclear. It also may lead to the emergence of problems during the use of the building after the project is completed (Shoabi, 1989).

Shoabi indicates that these problems of the variation in quality are due to more than one reason. 1. There are no licensing and registration regulations for the professions, no classification of architectural practices, no mechanism to decide who is liable for any faults, and no machinery for resolving conflicts among clients, designers, and contractors. 2. There is nowhere laid down a description of the services the architect ought to provide. There are also no recognised criteria which a client can use in selecting a good consultant or contractor. 3. In Saudi Arabia there are no building codes and standards specific to the country, such as fire and safety regulations, standards for electrical and structural services, or a generally recognised documentation system for the consultancy and construction process. So each office uses one particular system with which it feels comfortable. If then, from time to time, a client asks an office to design a project according to the American or the British system, it has to adapt to a system that it is not accustomed to. 4. The sharp decrease in architecture fees in Saudi Arabia. Shoabi (1989) further points out that a comparison of architecture fees between Saudi Arabia, the UK, and Kuwait showed that the fees in Saudi Arabia were less than a third on average of those in the UK and Kuwait. This is hardly an incentive to produce top quality work.

In a report produced by the Municipality of Jeddah (The Performance of Architectural Offices in Jeddah, 1996) it states:

> It has been lately noticed that there is an increasing number of architectural offices in the city of Jeddah whose work is deteriorating in quality. The concept of the projects themselves and the presentation of them (drawings) are deficient, and also the high number of professional mistakes (plans for individual floors do not match, architectural drawings do not match engineering drawings for the corresponding floor, etc.) is noticeable. (p. 5)

The municipality has tried to uncover the causes of this, and they have highlighted the poor quality of the personnel in some of the offices. It was also found that there was some dishonesty, in that in some cases designs were initially not produced by architects but were simply taken to architects' offices to get stamped.

Further they have come up with the explanation that the quantity of projects done is more than can be handled, so the projects are produced too hastily without having the proper time devoted to them. The reason for that is that the fees in those cases are very low in comparison with the international market, which causes some architectural practices to do too much in order to make ends meet.

In fact, according to a questionnaire on projects and staffing levels, the number of projects handled by any one office in a year varied from ten to 250, the latter being one per working day (Municipality of Jeddah, 1996). The office which did 250 projects a year was staffed by only one architect, one civil engineer, and one electrical engineer (the recommended annual number of projects for such an office is 17). The office which did ten has 150 architects, 55 civil engineers, 67 electrical engineers, and 250 draughtsmen.

Remarks that the Jeddah report makes about the quality of projects that are brought to the municipality for building permits include the following:

1. Architectural drawing quality varies between excellent and very poor.
2. The number of drawings produced varies between the minimum required and a full set of architectural and working drawings with all details and specifications.
3. Large number of mistakes over dimensions (for example proposed houses bigger than available plots).
4. No correlation between horizontal plans and vertical elevations.

5. The same plans produced over and over again by the same office for different projects.
6. The architectural drawings do not match with structural drawings, e.g. columns are located in the middle of a room.
7. Lack of architectural details.
8. Architectural access does not match structural access.
9. Architectural drawings often lack necessary information (for example architect's name, scale, date, type of drawing, date of design, etc.)
10. The internal space distribution for some projects is very poor.
11. Elevations are very bad and lack the rudiments of architecture.
12. Insufficient notes on structural drawings.
13. Lack of details in the structural drawings (Municipality of Jeddah, 1996).

In the same year the Municipality of Makkah produced a comparable report (The Deterioration of the Quality of Architecture Offices in Makkah, 1996), and its findings were strikingly similar.

This report was undertaken to study the nature of and the reasons behind the deteriorating quality of projects, and to make some suggestions to remedy the situation. They studied all the projects that came to the Municipality and found the following:

1. The quality of the projects varied from good to very poor. For example, some had poor ventilation or poor lighting.
2. The number of drawings provided was often less than the minimum required.
3. In the site plans, access was often not indicated.
4. The horizontal floor plans often did not match the vertical elevations.
5. Parking spaces were designed without any architectural standard.
6. The same design was often produced for different projects.
7. There was a lack of architectural details.
8. Elevations were aesthetically poor.

The reasons for these were adduced to be:

1. Poor quality of personnel.
2. Seeking to produce more projects than could be handled.

3. Financial rewards very poor compared with other Saudi cities, and also with the international market.
4. Some projects were designed by unqualified personnel, like civil engineers and draughtsmen.
5. Some of the offices in Makkah are branches of offices elsewhere and were not properly supervised.
6. The Municipality's architects who asked to assess the projects initially were not doing so properly; they were often new graduates with little experience.
7. There is no one to supervise architectural practice
8. There is no copyright for design.
9. Clients themselves have too little awareness of what to look for in a good architectural practice.
10. There are no written regulations for architectural practice.
11. In most cases no legal contract was drawn up (Municipality of Makkah, 1996).

According to this report, the number of projects varied from 80 to 200 a year, which means that an office with one architect and one civil engineer took just three days for a project. Explanations for the variation in quality and service may lie in the way day-to-day architecture is practised in Saudi Arabia.

The situation depicted in these reports from municipalities shows little advance from the way it was twenty years ago. The practitioner Fayez (interviewed 1998), reflecting on his early days in practice, states:

> When I started my professional practice during the seventies, it was in a very bad state in Saudi Arabia. Working drawing was only seven sheets, not containing any information. The quality of design was also low. Some of my Saudi colleagues who graduated from America told me: 'Don't bother yourself. The people will not pay you for your work. And the contractors do not know how to execute the projects.' The contractors didn't know how to do some of the work, such as heat insulation or water insulation. If you looked at drawings, you would have seen that every sheet was on a different scale, and there was no consistent system for working drawings or specification or anything like that at the time.

Comment on the implications of the profession of architecture as it is practised in Saudi Arabia for architectural education in Saudi Arabia comes from an English architecture teacher in a Saudi university. Hilton (interviewed 1998) links the attitudes of the students whom he teaches to the way offices conduct their practices. Of the students he comments:

> There is very little interest amongst the students in technical solutions to problems. They approach design more like designing a shape and then you go to an engineer and he can do the structure and the services. You find reluctance to get involved in technology. A lot of buildings are drawn in a very simple way, i.e. plans, elevation, and site plans. We talk in classes all the time about the service technology and how it affects design decisions at the different stages of the design process. However, when it comes to designing the buildings it is forgotten and you get the same cardboard cut-out sort of elevation.

Hilton points out that problems manifested in the training of architecture students stem from the practice itself: 'If you go to an office in Saudi Arabia the technicians do the shop drawings and the Saudi students rarely interest themselves in that kind of detail.' He claims that the way architecture is actually carried out in Saudi practices does not make the right demands of new practitioners or new graduates, and that this filters down to students. He comments that, in contrast to the UK, architects do comparatively little detailing and therefore have comparatively little need to know about technical aspects of building. He states that:

> Practice in Saudi Arabia is different from in the UK. A lot of the detailing of buildings is left to the contractor. A lot of the architects do very minimal drawings. In the contractor bids the architect does 'shop drawings' to use the American term. In the UK the architects do all the drawings and most of the drawings of details and technology. Graduates in the UK, therefore, are expected to have much more technical knowledge as well as design skills than students need here to survive.

The practitioner and writer Kamel is also critical of the quality of design produced today:

> The poor quality of architectural design that we are getting today is indicated by the fact that there are often no more than 20 to 30 sheets of drawings per project. A serious project would be expected to generate 100 to 200 sheets of drawings. The investor prefers to get his design cheap, but in the long run has to pay out more of his money on the construction and maintenance of his building (Kamel, 1998b).

The small number of drawings produced could be attributed to the shortcomings of architects as many have suggested, but there is also the point to be considered that the municipalities require only ask for a small number of basic drawings with no details or specifications required.

The minimum national drawings requirements for a project as laid down by the Ministry of Municipal and Rural Affairs (MOMRA) are:

1. Architectural drawings: site plan, first floor plan, upper floor plans, roof plan, the four elevations, a section.
2. Plumbing installations: first floor, upper floors.
3. Electrical installations: first floor, upper floors.
4. Structure: foundation, first floor plan, upper floor plans (MOMRA, 1989).

Also there is no institution in Saudi Arabia that spells out what kind and number of drawings should be included. In such practices there is no written code or procedure, such as is the case in the United Kingdom. A very detailed description of these services is included in the RIBA Architect's Appointment. From interviews with practitioners in large firms in Saudi Arabia it is evident that there is some confusion regarding services provided by architects. The architect's role may range from total control of the building construction process from inception to completion to merely that of a sketch design provider.

Standards could be best administered and followed if they were committed to print in the form of a handbook or set of written criteria, which could be used as a reference and guide for all those concerned with the building industry and for potential clients. Such a systematic code of standards would enhance the quality of the built environment (Dakhil, 1985).

5.6 The Development of Architectural Practice

In the past houses in Saudi Arabia were designed and built by the master builder *(Mu^{c}alim)*. If a client was interested in building a house, he had to go to a master builder with whom he would negotiate the house contract. They would discuss the client's desires, requirements, materials, cost, and design schemes. If they reached an agreement, the master builder started the design by drawing lines with his foot on the construction site itself, showing the external walls of the house, as well as interior walls and openings for doors and windows.

These lines represented the actual size, number, and spatial organisation of the rooms. The client could bring his family, neighbours, and friends to see the design and to suggest changes. If there were no changes, the master builder and his workers would start digging on these lines to establish the house foundations, and as construction progressed the house form would appear (Fadan, 1986; Farsi, 1998).

Before the unification of the Kingdom under King Abdul-Aziz in 1932, the situation in the Arabian peninsula had remained unchanged for centuries. There was no change in the size of towns and villages or in their populations. House design and building remained as it had been for centuries.

During the period before the housing boom, which occurred from1974 to1985, although there was less construction activity than later because of economic constraints connected with the state of the oil industry (See Section 5.2.4.2), certain procedures were initiated which set the standards and precedents for the later development of the architecture profession. These procedures were to dictate the nature of contemporary architecture, they were to initiate such comparatively few building laws as there were to be followed, such as the setback and height regulations, etc., and they led to the pattern of Saudi cities as they are today. The developments, of course, determined to a large extent the nature of architectural practice in the country.

The first of these was the Statute of Makkah - at that time the administrative capital - issued by Royal Decree No. 8723 of 1937. This statute gave the municipalities the responsibility of supervising the construction of building, and it also gave them the authority to develop zoning and building regulations. Makkah did in fact introduce some regulations, but, as is pointed out by Hathloul (1975) they were in any case the practices that were already followed in Saudi cities through tradition. The important thing about this move by Makkah, however, is that this was the first time such practices had been codified in writing. It was not until later that the procedures were established which gave rise to setback and other regulations currently in force.

It was developments in the Riyadh suburb of Malaz in 1953 that eventually led to the pattern of Saudi cities as they are today. In that year King Saud decided to move government agencies from Makkah to Riyadh, and it became necessary to provide housing for the transferred government employees. A site was selected in Malaz, and houses were constructed according to a gridiron pattern with a hierarchy of streets, rectangular blocks, and large plots generally square in shape.

This new pattern was in sharp contrast to the traditional pattern of the older parts of Riyadh, with quite a different use of space. Compared with the traditional pattern, there was a very low housing density (Rowe, 1983) more space assigned to streets, and no space assigned to private areas, an essential element in the traditional housing of the city (Hathloul, 1986).

The development at Malaz introduced both this new gridiron pattern and also a new house type, the villa. Both became models for subsequent new developments in Saudi cities. This came about through the decision of the government in 1968 to assign the task of further planning the capital to Doxiades Associates, a Greek company. Doxiades introduced the square plot as the basic land subdivision, which in itself meant a gridiron pattern for the city, and cleared the way for the villa as the standard dwelling house, a design which was reinforced by the setback regulations introduced. The work of Doxiades was approved by the Council of Ministers in 1973, having been completed in 1971, and with this official sanction the gridiron pattern became institutionalised in the Kingdom's cities.

Another development that took place before the country's construction boom and affected the practice of architecture was Ministerial Resolution No. 420 of 1968, which established the licensing of the consulting engineering profession[24]. This resolution consisted of three articles:

1. No person, office or company may practise any kind of Engineering Consultancy except after obtaining a licence from the appropriate department at the Ministry of Commerce.
2. No engineering works or projects shall be carried out or executed unless the designs and plans are prepared and issued by a Consulting Engineer licensed by the Ministry of Commerce.
3. Licences shall only be issued to those who hold Bachelor of Engineering Degrees.

With this resolution anyone with an engineering degree could open a consultancy office and carry out architectural design. This has been a challenge to the position of the architect in Saudi Arabia as designer.

The housing boom started in 1974 following the sharp increase in oil prices (See Section 5.2.4.2) when the government wished to develop the country's infrastructure, and especially to increase the housing stock to deal with the new economic situation, including increasing numbers moving to urban areas. The MHPW was therefore established, and, in 1975, the Real Estate Development Fund (REDF) set up.

In the years 1974-1996 an estimated 790,000 housing units were constructed, of which 545,300 were built by the private sector with REDF assistance. Within that period, 1975-1980 saw the erection of 338,584 units, of which some 200,000 were privately built with REDF assistance (Ministry of Planning, 1997). The year 1982 saw SR 130 billion in government construction expenditure (Akbar, 1986). By this time many of the factors which have affected the standing and reputation of architecture practitioners in Saudi Arabia had been set in place.

[24] The housing authorities, however, did not require clients to go to these offices and to obtain an approved house design until the establishment of the Real Estate Development Fund (REDF) in 1975.

Prior to the Third Plan period the construction industry had been very largely in the private sector and to a large extent in foreign hands, with many of the companies and much of the labour force being non-Saudi.

The intention behind the REDF was to use the financial resources which had come into the country through the exploitation of oil to deal with the acute shortage of housing associated with the increasing population move to urban areas, by enabling people to realise their ambitions to build their own homes. Applicants became eligible to receive a sum of up to SR 300,000 (£50,000), interest free and repayable over a period of 25 years. Loans extended by the REDF rose to SR 8.6 billion (£1.43 billion) in 1980 and stayed at that level for some five years, before dropping to SR 2.4 billion (£0.4 billion) by 1997 (Ministry of Planning, 1997).

In the general enthusiasm to exploit the new wealth of the Kingdom and build up its infrastructure and fabric with minimum delay, the REDF granted double the loan amount to applicants who opted for new materials such as reinforced concrete and glass windows. This had two consequences: the first was that it discouraged the use of local materials and subsequently encouraged the use of modern materials such as concrete and glass. Indeed, as one researcher has pointed out:

> The specifications of the fund require the use of materials that are totally alien to the traditional building material . . . Some of these materials are imported from other countries . . . The REDF specifications are applied in the whole Kingdom with its five regions without consideration to [sic] the local architecture of each region. (Rugaib, 1988).

The second consequence of the REDF's granting double the amount of money to those who opted for new materials was that new structural systems were introduced, which prompted municipalities to ask clients who had plots of less than 100 square metres to submit a structural design signed by an authorised professional, and forced others to bring complete designs of their houses from professionals. Because of this demand architectural services became a lucrative business and prices rocketed.[25]

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[25] An REDF study shows that in 1976 design costs in Saudi Arabia compared to those in the USA were 15-20 percent higher. The building material costs were 20-30 percent higher (Monif, 1979).

A further reason for the dramatic increase in construction costs at this time was the persistence of rumours to the effect that the REDF was about to close, or that it would place heavy restrictions on loans (Dakhil, 1985).

This demand for design services because people wanted to be granted an REDF loan as soon as possible was so great that architects' practices became unable to cope with it. This, combined with the fact that the services began to be offered more cheaply by draughtsmen, surveyors, and so on, meant that clients started to go to those non-professional sources, and the quality of design began to fall. But this fall in quality was only partly because designs were now being produced by non-professionals; it was also because, in order to retain clients and compete in terms of cost, architects were themselves cutting corners by allowing civil engineers or draughtsmen in their offices to carry out design. Some architectural offices also started the practice of signature selling, whereby they would sell an architect's signature to be appended to a design produced by non-professionals in order for them to gain a building permit.
In 1983, 39 percent of houses designed within Riyadh were designed by architects with the remaining 61 percent designed by civil and electrical engineers. The following year the percentages had changed to 33 and 67 respectively, an indication that the situation was deteriorating (Jowair, 1990).

In those circumstances, in order to control the quality of architecture design being produced, municipalities began to take certain measures. For example in 1980 the municipality of Riyadh introduced the Co-operative Programme, which permitted all Saudi architects and engineers employed in various government agencies in the city to practise housing design. The programme restricted the number of designs that could be produced by any one individual to 24 a year. Although this step was welcome in that it allowed architecture graduates to practise the profession for which they had been trained, it had the disadvantage that it also allowed engineers to design, and this had negative consequences both for the standing of architects and for the quality of the buildings produced. In his study of this programme, Jowair (1990) finds that almost two fifths (38%) of buildings produced by the Co-operative Programme were deemed unsuitable by the municipality[26].

A further measure by the municipality of Riyadh which reduced prices and challenged the architect was the production in 1985 of a catalogue of 64 different house design models from which clients could select without going to an architect. Each model was priced at SR 1,000 (£167) and included a complete set of drawings. This procedure, which is still followed, takes just one working day, an indication of how cheap and quick it is. This, of course, had the anomalous consequence that the body which monitored the work of architects in Riyadh was also their main competitor in house design. No such intention lay behind the measure, however, since it was taken with the aim of improving the quality of design, but the effect was to undermine the role of the architect. The REDF itself also began to produce sample designs available to all private loan customers, thus lowering the overall costs. This reduction in costs meant that architects themselves were under pressure from yet another source to provide their services more cheaply, and thus potentially lowering the quality of their service. The general public will not understand the value of the architect if it is possible to buy ready-made plans from the municipality or from the REDF. The expertise and services of the architect will no longer be valued (Ghamadi, 1985).

In order to compete with the municipality, architects in Riyadh began to shortcut the consultation and design process. Jowair (1990) finds that by 1990, 56 percent of architects showed clients ready-made designs of houses at the first meeting, instead of noting requirements and designing for each client individually. He also finds that 23 percent sketched out their concepts from designs which had actually been submitted to them by clients. This is a fact which is the subject of much comment (See Fig. 5.8).

Because the architects did not want to lose the clients' business they started to accept this procedure, even although it placed them in the role of draughtsmen rather than professional architects. This may initially seem, as Jowair interprets it, to indicate a

[26] According to information gleaned from Riyadh municipal archives Co-operative architects and civil engineers accounted for 59 percent of all housing units designed from 1980 to 1986 (Jowair, 1990).

lack of commitment from the architect to the client, but it has to be seen as action forced upon architecture practitioners against the background of the challenges in Saudi Arabia to the architect's standing and professional success that are typified by this example of the measures taken by Riyadh municipality.

Against this background, where architects are forced to adopt the roles and carry out the procedures of draughtsmen, it is no surprise if clients see no difference – except perhaps for higher fees – between the service provided by architects and that provided by mere draughtsmen. Jowair (1990) claims that to a large extent architectural practice in Saudi Arabia is

> a mere drafting process. It can be called anything but a design process. This is an exploitation of clients who do not know what they are entitled to or what to expect from an architect. If there is no code of professional practice and no regulation to enforce the implementation of that code architects will not hesitate to use [any] means possible to minimize their services, especially when competing architects lower their fees to attract clients seeking the cheapest fees. (p. 143)

One of the problems, then, facing this new generation of graduates was that the designing of buildings in the country was not the monopoly of architects. Anyone could design, whether he was an civil engineer, a constructor, an electrical engineer, a city planner, or whatever; even draughtsmen and surveyors could be involved in design. Such an amount of design work being produced by non-architects challenges the architect because it reduces the cost (since clients wish to build houses as cheaply as possible). As has been remarked by the head of one large corporation, 'Sometimes architectural practice in this country does not put bread on the table' (Fayez, head of a Saudi architectural practice, interviewed 1998).

A further challenge facing architects in Saudi Arabia is that there is no copyright on design. This means, for example, that an architect can design a house for a client, and that the client can then make whatever changes he wishes to the design without further reference (or payment) to the architect who originated it. The client is also free to pass on this design to a third party without hindrance. On the other hand, an architect is also free to design a house for one client, and then to give the same design to another client without doing any further work on it. All of these situations are challenges to the success and the integrity of an architect who wishes to provide a professional service to clients and to be rewarded accordingly.

By the 1980s and into the 1990s awareness of the architectural situation and its problems was growing amongst Saudi architects, and there began what might be called a return to their roots in terms of the appraisal of the architectural scene in the country. Various reasons may be adduced for this. One was that there was an increasing interest in and movement towards regionalism and post-modernism globally, and this manifested itself in the world of architecture. Another reason was that the establishment of the schools of architecture in Saudi Arabia was beginning to have an effect. Although some of the early impetus in the schools had been foreign, at least they began to address the problem of local architecture. Also, by the 1980s, the first Saudi architect graduates had been in practice for some years and were beginning to make their influence felt, and new graduates no longer had to spend five years working in government service, but could import the ideas and concepts they had been taught straight into private practice. In addition those Saudi architecture graduates who had spent some time abroad to gain Ph.D.s began to return to the country and were able to look at the architecture situation with fresh awareness. Some of them began to write about it. A further reason for the increase of awareness was the foundation in 1988 of the Saudi Omran Society. Although, as we have seen (Section 5.4.4) this is not a professional organisation with monitoring and controlling powers, the workshops and lectures which it organises support its aims of promoting the heritage of Islamic architecture and promoting the local identity of the built environment. Publications devoted to architecture and building, such as Albenaa (founded 1979), also help to underpin the increasing appreciation of traditional architectural issues. A further factor contributing to the increased awareness of the built environment is the fact that the frenzy, as it were, of the preceding decades in Saudi Arabia has now died down. The physical infrastructure, which had been set up with such vigour and speed in the early period of the Five-Year Plans and in the wake of the new-found wealth of the Kingdom, is now in place, and the atmosphere allows more time for reflection and assessment.

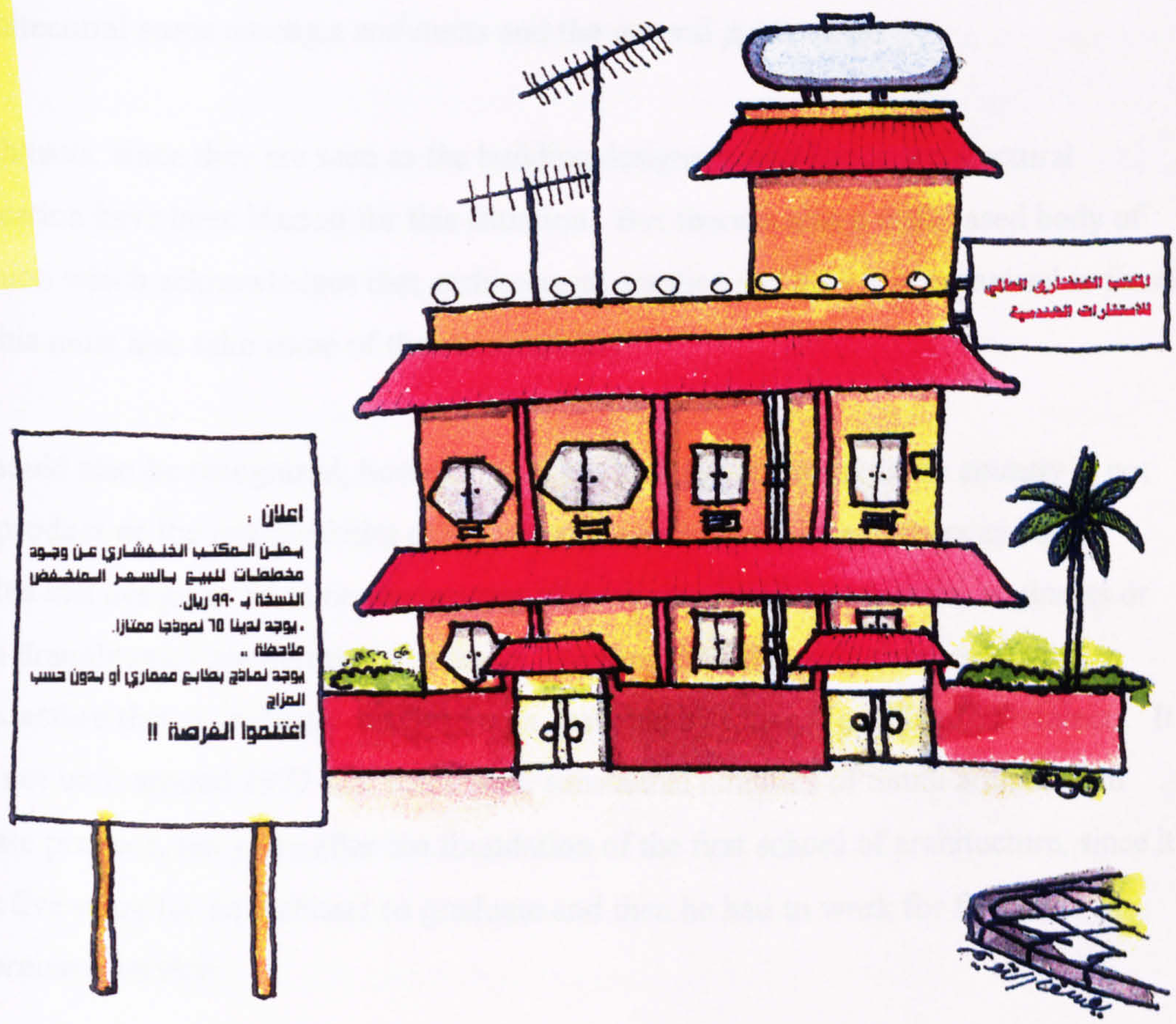

Fig. 5.8: The front sign says: 'We have plans for sale for SR 990. We have 65 different models. We offer different styles. Come now.' The upper sign says: 'The *Khonfishary* International Architectural Consultancy Office' Source: (Albenaa, 1985).

5.7 Summary

Set against the historical, geographical, climatic, demographic, and cultural background of Saudi Arabia, we have shown how contemporary architecture, unlike traditional architecture, has failed to meet the socio-cultural needs of the people and the climatic conditions of the environment, which has led to general dissatisfaction with the architectural scene amongst architects and the general public alike.

Architects, since they are seen as the building designers, and hence architectural education have been blamed for this situation. But there is also a well-based body of opinion which acknowledges that architectural practice and how it is organised in Saudi Arabia must also take some of the responsibility.

It should also be recognised, however, that the built environment in the country is not the product or the responsibility of the country's architects alone. Others in Saudi Arabia can design or be in on the process of designing besides architects; engineers or even draughtsmen are permitted to do so. And much of the early contemporary architecture that *is* architect-designed was designed by foreign, not Saudi, architects. It was not until around 1977 that there were substantial numbers of Saudi architects in private practice, ten years after the foundation of the first school of architecture, since it took five years for an architect to graduate and then he had to work for five years in government service.

We have indicated that the building regulations in Saudi Arabia militate against architectural diligence and quality, being concerned only with setback and with height, so that anyone designing or constructing a building had a minimum of laws and rules to adhere to, again a factor which militates against quality in architecture.

We have seen how, during the early part of the housing boom period, architectural services were much in demand and fees rose. However, such was the demand that architects alone could not cope, and the introduction of REDF loans and measures such as the catalogue produced by Riyadh municipality, combined with the fact that non-architects were allowed to design and were doing so more inexpensively, meant that clients began to look for quick and cheap solutions to their housing requirements.

Saudi Arabia, as we have seen, has also very little in the way of standards and specifications. This means that there is a lack of consistency in the building industry, a further factor contributing to the poor reputation that it has gained.

We have indicated that the architecture profession in Saudi Arabia suffers from the lack of a professional body to guide and organise professional practice and to influence the training of architects. The Saudi Omran Society, although an admirable association which had helped to raise awareness of architectural issues in the last decade, is in some ways a government body, and it lacks the power to act in the way that RIBA in the United Kingdom or the AIA in the United States do.

The situation of architectural practice in Saudi Arabia, being unorganised, contributes to the gap between architectural education and practice in the country. Because architectural practice in Saudi Arabia is not organised, it is difficult for schools of architecture to keep up with practice and to prepare their students for the profession. Although schools of architecture generally receive the blame for the education/practice gap, practice is also to an extent the culprit.

We have shown that, in recent years, signs have emerged that the situation may be ripe for improvement. Various factors have led to a greater awareness of the architectural situation in Saudi Arabia and architecture practitioners and teachers have been able to recognise that the profession is at a low ebb and commit some of their ideas to print.

PART III

Architectural Education in Saudi Arabia and Its Relation to Practice

Chapter 6

The Educational Context of Architectural Education in Saudi Arabia

6.1 Introduction

Before discussing specifically architectural education in Saudi Arabia, it would be constructive to give a brief general account of the nature of pre-university and university education in Saudi Arabia as it has evolved since the establishment of the state in 1932, in order to complete the overall picture and achieve an appreciation of the context within which architectural education in the Kingdom of Saudi Arabia operates.

Early education in the years before the establishment of formal education is described and placed in its historical and social context, as are current elementary, intermediate, and secondary education. A brief account of the organisation and curriculum approach of secondary school education is given, since it is felt by many that the study methods encouraged by the organisation of pre-university education has a negative effect on the ability of students to deal adequately with the requirements of the study of architecture once they reach university. Also, a description of the structure and emergence of the Saudi universities is provided, with a brief account of the individual universities and their areas of specialisation.

This chapter, accordingly, addresses public education in Saudi Arabia, which can be conveniently considered under two main headings:

- General Education, which extends from kindergarten to secondary education, and also covers some teacher training colleges for males and females.
- Higher Education, which covers education in universities and colleges.

6.2 General Education

General education (pre-university education) in Saudi Arabia is totally funded by the government, and is free for all school pupils. It may be divided into three areas: primary, intermediate and secondary. We will look briefly at the history of general education and at the structure and organisation of these three areas.

6.2.1 The Emergence of General Education

Historically, the land of Arabia was the only Arab land that escaped direct colonial occupation and domination. Its society continued throughout the nineteenth and early twentieth centuries to enjoy a large degree of autonomy. Hence, many of its cultural aspects and traditional institutions evolved mostly intact and experienced no dramatic changes. In the educational field, classes for reading and memorising the Quran along with selections from the *Hadith* (the body of tradition about the Prophet Mohammed and his followers) were sponsored in towns and villages throughout the peninsula. Thus the mosque and the houses of the *Ulama* (Islamic scholars) remained the main locations for learning and intellectual discourse.

At the most elementary level, education took place in the *Kuttab*, a class of Quran recitation for children usually attached to a mosque, or as a private tutorial held in the home under the direction of a professional Quran reader, usually a female in the case of girls. In the late nineteenth century, non-religious subjects were also taught under Ottoman rule (the Turkish authority) in the Hijaz and Al-Ahsa Provinces, where *Kuttab* schools specialising in Quran memorisation sometimes taught theology, literature, grammar, and arithmetic. The number of these schools reached 78 in 1915. The Hashemite rulers inherited these schools when Hijaz became independent from Turkish sovereignty and came under their rule in 1916. During the rule of both the Turks and Hashemites Hijaz also witnessed, besides the *Kuttab*, primary schools, and mosque classes, a tremendous effort of educational revivalism at the hands of some private Muslim philanthropists like Haj Mohammed Ali Al-Riza, who established Al-Falah schools in Makkah and Jeddah in 1908. However, in most parts of Arabia there were almost no organised educational activities or facilities of significance apart from a very few scattered classes in the mosques and *Kuttabs* (Metz,1992; Faheem, 1982). The literacy picture in most of Arabia before the creation of the Kingdom of Saudi Arabia (which was not finalised until 1932) was therefore very bleak. This situation has improved significantly, however, as a consequence of the ambitious educational campaign launched by the Saudi government.

When King Abdul-Aziz, the founder of the state, synthesised the various parts of the country into the new Saudi Arabia, he recognised that, if the Kingdom was to compete in an increasingly complex modern world, it had to prepare well-qualified Saudis who could run the country and develop it socially and economically. King Abdul-Aziz felt the need for a secular education that would benefit the country while still being consistent with Islamic beliefs and practices (Jan, 1983).

As a result of this commitment, the General Directorate of Education was established in 1924, before the final unification of Saudi Arabia. Most interestingly, this preceded the declaration of the major regulations and principles that defined the governance and the administration of the state, which were issued in 1925 (Saegh, 1983). In 1926, the first educational council was formed, and some major policies of the Saudi educational system were announced (Ministry of Higher Education, 1980).

Formal primary education began in Saudi Arabia in the 1930s, and by 1945 King Abdul-Aziz had initiated an extensive programme to establish schools in the Kingdom. Six years later, in 1951, the country had 226 schools with 29,887 pupils. In 1954, the Ministry of Education was established, headed by the then Prince Fahad (now King Fahad) the first Minister of Education.

Since the inception of the Five-Year Development Plans in 1970 (See Chapter 5) education as a major means of human development has been gradually expanded to meet the urgent demands created by the continuous development of the nation. As a result of this continuing commitment, the education system in the Kingdom has expanded rapidly.

In 1970, in comparison with all countries in the Middle East and North Africa, the literacy rate of 15 percent for men and 2 percent for women in Saudi Arabia was lower only in Yemen and Afghanistan. By 1990, the literacy rate for men had risen to 73 percent and that for women to 48 percent. There was therefore a steep rise in literacy rates within just twenty years (Metz, 1992).

Quantitatively the expansion in the field of education has been notable. The number of boys' schools increased from 2,772 in1969-70 to 11,282 in 1996-97. The number of girls' schools also increased from 511 in 1969-70 to 10,871 in 1996-97 (Ministry of Planning, 1997).

The total number of pupils and students enrolled in all educational institutions increased from 547,000 in 1969-70 to over 4,300,000 in 1996-97. In 1996-97. The number of pupils receiving elementary education rose from 397,000 in 1969-70 to 2,300,000 in 1996-97. The number of pupils receiving intermediate and secondary education expanded from 77,000 to 1,463,000 over the same period (Ministry of Planning, 1997).

In recent years, increasing emphasis has been placed on relating the educational system to the needs of the country. All six of the Kingdom's Five-Year National Development Plans (covering the years 1970 - 2000) express major concern over the importance of developing human resources in order to convert Saudi Arabia from an underdeveloped country to a fully developed one. In the current Five-Year Plan it is clear that the government's commitment to improve the educational facilities has been reaffirmed in the successive development plans in the Kingdom. The Ministry of Planning states:

> The real wealth of the Kingdom ultimately lies in the productive skills of its labour force. Accordingly, the development plans have placed great importance on human resources development through continuous advances in primary, intermediate, secondary and higher education, as well as in technical education and vocational training. The result has been a great increase in the productive employment of Saudi citizens and a steady upgrading of the skill levels and occupational achievements of the Saudi labour force. (Ministry of Planning, 1995, p. 41)

The organisation and structure of general education in Saudi Arabia is aimed at fulfilling the general educational policy as set out by the Ministry of Education:

> The purpose of education is to have the student understand Islam in a correct, comprehensive manner, to plan and spread the Islamic creed, to furnish the student with the values, teachings and ideals of

> Islam, to equip him with various skills and knowledge, to develop his conduct in constructive directions, to develop society economically, socially, and culturally, and to prepare the individual to become a useful member in the building of his community. (Ministry of Education, 1980, p. 19)

6.2.2 Governance and Administration of General Education

Because of the small percentages of enrolled pupils in the past, education was supervised by one agency, the General Directorate of Education.[27] However, due to the enormous growth of Saudis enrolled in educational institutions nationwide, especially during the last two decades, several educational agencies have been established to oversee the education of Saudi citizens. All of these organisations come under the jurisdiction of the Higher Committee on Educational Policy, presided over by the King, established in 1965. General education in Saudi Arabia is the remit of two agencies, one dealing with education for males, the Ministry of Education, and the other with education for females, the General Presidency of Girls' Education.

The Ministry of Education was established in 1954, replacing the General Directorate of Education. It is responsible primarily for boys' education, and also directs some adult non-university education. The Ministry of Education sets overall standards for the country's educational system and also oversees special education for the handicapped. Its system is structured along the following lines:

- General education including kindergarten, elementary, intermediate, and secondary education.
- Teacher training.
- Special education for handicapped students.
- Adult education.

The General Presidency for Girls' Education, which was established in 1960, controls and supervises the education of girls. In addition to the three main levels of education, the Presidency controls colleges of education and a number of junior teacher training

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[27]Replaced by the Ministry of Education in 1954.

colleges, as well as the education of boys and girls at the pre-elementary stage. It administers the girls' schools and colleges, supervises kindergartens and nursery schools, and sponsors literacy programmes for females.

6.2.3 The Structure of General Education

General education in the Kingdom consists of kindergarten, elementary, intermediate, and high school (secondary) education.

Kindergartens provide two years of pre-school education, for children aged 4-6. Attendance at kindergarten, however, is not a prerequisite for admission to the first level of education proper.

The first level of school education is the elementary stage. It represents the base of the education pyramid with a six grade progression. Children are expected to enrol at the age of six and leave at the age of 12. Elementary school offers the children the basics of Islamic culture and equips them with the elementary skills of reading, writing, and arithmetic.

The second level of education is the intermediate stage, for pupils from 12-15 years of age. This stage lasts for three years. It prepares pupils to continue their studies at the secondary level, and it reinforces and builds on the basic skills the pupils acquired in the elementary stage.

The last stage of general education in Saudi Arabia is secondary education. This stage is for pupils aged 15-18. In the last two years of this stage pupils must choose either the natural sciences or the humanities branch.[28] After successful completion of this stage, pupils are eligible to enter any institution of higher education.

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[28] Architecture schools in Saudi Arabia accept only students with science secondary education certificates. This admission policy is not without its consequences on the aptitude of architecture students (see Chapter 7).

For less academic pupils who do not go on to high school, secondary education is completed by a three-year spell at a vocational school which guides them in a craft or trade direction, such as electricity, plumbing, the building trade, etc. Pupils who attend this sort of school do not proceed to higher education, including architectural education. This is at odds with the traditional source of architects in the past, who normally came from building crafts through the apprenticeship system.

One feature of pre-university education in Saudi Arabia is that there is no grounding either in the subjects of instruction, in the curriculum structure, or in the teaching methods employed, to prepare students for architectural education.

Architecture, as a subject, does not feature in the national pre-university curriculum. This in itself is perhaps not surprising, nor perhaps indeed particularly crucial. It is linked to the comparative newness of architecture as a distinct profession and therefore as a distinct discipline in the country. Speaking of the education/practice gap in architectural education in Saudi Arabia the teacher Siddiqi (interviewed 1998) states:

> Coming down to issues related to Saudi Arabia, this gap is wider and much bigger. The reasons are many. Education and training in architecture is comparatively new to society. Saudi Arabia started the schools of architecture during the 70s. Architectural education, therefore, came much later compared to other professions such as medicine and law.
>
> Another reason is that, because it came much later, pre-university education never had anything in their own curriculum and syllabus to prepare their students for what they would meet in an architectural career. They had plenty of emphasis on engineering, social sciences, and medicine. But up to now there is no school curriculum in the kingdom that actually emphasises architecture as a practising profession. This is one of the major reasons why the gap is there. The students take a long time to understand the profession and the professional implications of architecture. So they inherently fall back compared to other students.

In speaking about the gap between education and practice the practitioner Aba-Al-Khail (interviewed 1998) also offers the comment: 'General education also contributes to the falling quality of architecture students. There is no teaching of architecture in high school and there are no art classes.'

More problematic is the way the curriculum is structured and the way that it is taught, factors which tend to produce a particular type of student with a particular way of approaching study and examinations. In this connection one of the remarks that the researcher heard regularly from teacher interviewees commenting on the gap between education and practice was that Saudi students tend to think in certain pre-determined ways, and that they seem to find it hard to integrate and synthesise subjects and information which they meet in their course. This is noted by Hilton (interviewed 1998), an English teacher of architecture in Saudi Arabia. Linking the situation specifically to pre-university education in the Kingdom he comments on the

> compartmentalised way of thinking. You do this thing and you pass it and you completely ignore it after that. They don't realise the value of it. This is how secondary education in this country is organised. It encourages the student to memorise. It does not foster analytical thinking. We have some students who are very good at memorising but not applying. I teach the Housing Theory course and I use a lot of sketches and drawings. Some of the students get an 'A', but when they sit down to do the housing programme they are as though they have not learned anything about it. The problem is getting worse as time progresses.

Another teacher, Ustankok (interviewed 1998), relates the failure of students to respond to all the various requirements of the curriculum to the weaknesses spotted by Hilton:

> My personal conclusion is that there is perhaps a cultural tendency to compartmentalise things. Like when you examine one of your students in any one of these components of the curriculum they know everything. Like if you examine them on environmental control systems they know everything, but they do not know how to use the information. But maybe it is a cultural tendency to keep things in their proper pocket rather than mix them together and do something else with them.

These comments by interviewees point to the way that pre-university education in Saudi Arabia is organised. School classes usually run from 8 a.m. to 2 p.m., with periods of around 45 minutes each. Each class is a separate subject, with a different teacher, and there is an appropriate textbook for each subject. Since the curriculum is text-based, at the end of each semester the students take an exam on each subject with the questions generated by material in the textbooks. The tendency is thus for the students simply to memorise the books for examination purposes. In view of this approach to the curriculum and to instruction it is no wonder that there has been criticism from the interviewees, or that they say that the way of studying encouraged by this teaching approach is one of the shortcomings that the students bring with them to their university courses. Students display an ability to memorise, but no inability to analyse. They try to compartmentalise subjects rather than to integrate them to create something new.

What is ideally required from an architecture student, however, is a different quality. Students need the ability to analyse and to understand, and to integrate what they have understood and to synthesise it in the design studio. The teacher Ustankok (interviewed 1998) explains:

> Some of the students are very good students, who can recite things, memorise them and give them back to you in theoretical courses beautifully. But this is not the sort of attitude you expect from the students in the design studios. In the design studio you look for initiative from the students, you need inquisitiveness, you need efficiency. All these things are not part of the early training of students, who are basically much better at memorising. That makes them good engineers, I am sure. That makes them good medical professionals, I am sure. That makes them very good lawyers, I am sure. But those assets of the students are good in other fields of education, but not necessarily in the design studio, where a different type of mental activity is required. And I don't see any other way of producing a design project without the students synthesising all the information that is given to them in the curriculum.

The teacher Fadan (interviewed 1998) agrees:

> All the requirements for the training of architects are in the curriculum. The problem, as I see it [is that] . . . the individual subjects should feed into the design studio like rivers feed into a lake, but in fact the students do not have the skills to apply in the studio the knowledge they get in their courses.

6.3 Higher Education

Higher education (university education) in Saudi Arabia is open to every citizen who has the academic capabilities. The system benefits from considerable financial support and it is able to provide students with free tuition. University students, both male and female, receive financial bursaries, free housing, meals, and health services. Female students are also provided with free transportation, while male students receive transportation at subsidised prices.

In this section we will look briefly at the rise of higher education in Saudi Arabia, and describe its organisation and structure. Particular attention will be paid to the university sector, in which the country's schools of architecture are located.

6.3.1 The Emergence of Higher Education

In a country where primary education began only in the late 1930s, and where a serious secondary educational programme was only conceived in 1953, it is natural that higher education was at first given a lower priority than general education. Nevertheless, with the programme of general education increasing at an accelerating pace, the Saudi government directed that special attention should be given to education at the university level.

Abdul-Wassie (1969) points out that in the early stages of the Kingdom's development (that is, before the period of rapid expansion in the 1970s and 1980s) pre-university education curricula were largely shaped to enable students to pursue their college education abroad in one of the neighbouring Arab countries, namely Egypt, Lebanon, Syria, Iraq, and Sudan.

Although sending Saudi students abroad helped provide the country with a sizeable number of nationals who were competent in various fields, this policy did not seem to satisfy the country's ever-increasing need for more experts and professional scholars. Consequently, the government viewed the establishment of higher education institutions and graduate schools as a proper step that must be taken in meeting the professional/manpower needs of the country. On the other hand, the need for teachers of Arabic, religion, and social studies increased with the expansion of public education. As a result, the Directorate of Education established the College of *Shari'a* (Islamic law) in Makkah in 1949. The decision was a precedent-setting one because the College was the first state-supported institution, not just in Saudi Arabia, but in the whole Arabian peninsula.

The demand for more higher educational institutions was in part a result of the tremendous growth of the Saudi economy and the increasing integration of the country into the world market. The exportation of oil and the large revenue generated from this exportation forced the country into a more active role in the international scene. A large portion of the income derived from oil was spent on building the infrastructure and on purchasing western goods and technology for consumption or development. The huge amount of money allocated to be spent each year inflated the economy and created acute shortages of manpower and facilities, so that thousands of foreign workers - skilled and unskilled - were brought in each year to help in filling the vacancies in almost every sector of the economy. Manpower shortages and economic growth were therefore amongst the main reasons for the expansion of higher educational institutes and the increasing numbers of university students in the years following the exploitation of oil. Although each year the best and most able students were still being sent abroad for more specialised education, by the late 1970s several colleges and other institutes of higher learning were in the planning stage (Faheem, 1982).

With such a dramatic expansion there could not be any possible initial way to deal with it except the importing of systems and forms, as well as personnel, from outside. As with imported technology the imported systems of education did not always fit well into existing Saudi society, and they brought with them a number of inbuilt cultural and value-related components (Ateshin, 1987).

From its inception, higher education in Saudi Arabia therefore depended on foreign educational systems. Egypt represented the first influence on higher-education systems in Saudi Arabia. As Abdul-Wassie, a former Deputy Minister of Education, wrote:

> Our educational policy has related for a long time to some Arab countries. It followed their curriculum planning, and also tended to use their textbooks. It was necessary for us to do that in order to facilitate the way for secondary school students to join their universities. At times there were no universities in our country as there are now. (Abdul-Wassie, 1969, p. 56.)

Indeed as we shall see (Chapter 7) the influence on the schools of architecture in Saudi Arabia's universities has largely been American, although the first architecture school, that at King Saud University, was established according to the Egyptian pattern. Faheem (1982) states:

> King Saud University - in its organisation, administration, and curricula - has been deeply influenced by, and follows to a considerable degree, the practice of Egyptian universities. This is because some of the early executives and most of the senior teachers were Egyptians, which is true to some extent even today. (p. 143)

The Saudi Arabian educational strategy has also been closely influenced by that of western countries such as the UK, France, and the United States. At first there was in fact no direct relationship between Saudi education and western educational systems, but western influences were transmitted to Saudi Arabia through the neighbouring Arab countries, and they had been affected by western systems of education. Increasingly it was to English-speaking countries like the United States and Britain that Saudi Arabia sent a large number of students to be educated, rather than to Egypt or other Arab countries (Jan, 1983).

As far back as 1980, one study placed the number of Saudi students in the United States at over 12,000 (Ajroush, 1980). Upon finishing their degrees, these students returned home with new ideas about and strategies for education. They became extremely influential, especially when they were assigned positions in the educational hierarchy. In this regard, Ajroush states:

> Today the impact of American influences is seen in all major forms of development in the country and educational development is by no means neglected. This influence is seen in two forms. One is the indirect influence of young Saudis who obtained their higher education in the West, mainly in the United States. These young people go home with different degrees (B.S., M.A., Ph.D., etc.) and different specialisations. They return full of ambition and new educational ideas. Naturally, these ideas stem from the American educational philosophy and ideology. The second influence is a direct one where American educators work as consultants to the Ministry of Education and other governmental agencies to aid in its development program. (1980, p. 67)

In her study of the American influence on the development of the universities in Saudi Arabia, Marks (1980) reaches the same conclusion. She states:

> The American influence in the Kingdom of Saudi Arabia has been twofold: firstly as a result of the presence of Americans in the country who came as oil workers at the invitation of the monarch; and secondly, as a result of the many Saudi students who obtained their university education in the United States. (p. 126)

Faheem (1982) also delineates the picture of western influences as they relate to universities in Saudi Arabia. He notes:

> There is now a growing shift in the universities of Saudi Arabia from humanistic and religious topics to more of Western technical and professional knowledge. . . Among the newly modern-oriented universities, there is almost a total dependence on foreign models and forms of educational arrangements. They have relied heavily on foreign Western experts to map their charts of growth and development and they have borrowed in a 'package deal' all of their educational organisation, contents and conceptions. . . The modern-oriented universities (Universities of Riyadh, King Abdulaziz, Petroleum and Mineral, King Faisal) and even most of the religious-oriented universities have borrowed their mode of educational arrangements (admission policy, examination, credential, faculty and department organisation and administrative procedures) mainly from the West. (p. 80)

The adoption of western knowledge, technology, and even personnel were the result of the acceptance of the notion of 'modernisation', the absence of a viable local alternative model of education, the lack of essential local resources (books, equipment, and personnel), and a keen aspiration for rapid economic growth in as short a time as possible. This educational transfer, however, was not entirely beneficial to Saudi Arabia, as it did not fit readily with its cultural heritage and tradition. Many aspects of the borrowed western institutions were neither suitable nor functional to the needs and aspirations of the Kingdom. One commentator describes the situation thus:

> Further, the dependence on western knowledge and ideas undermines the efforts of local universities to build a new, locally relevant knowledge. A dependent university could become an agent of western cultural domination and penetration. It could create a group of westernised, secularised, and alienated individuals who are linked culturally and mentally to the centre (the industrial western countries). (Faheem, 1982, p. 119)

And, writing earlier in this 'borrowing' process, Jammaz (1973) states:

> One of the most important problems, however, is that the whole system has been a borrowed instrument. An equally important

> problem is that little research has been undertaken in order to assess the workability and effectiveness of this borrowed instrument. (p.3)

Ateshin (1987) notes that, quite apart from the educational links with the United States through the Saudi students who studied there, the United States was such a powerful and influential country that it would be the first example to be considered when thinking of adopting ready-made educational institutions and systems:

> It would be natural and understandable under the circumstances to adopt American institutions as models in areas where these institutions excel. One should note that not only the arts, sciences and technology faculties were structured as such but the faculties of *Shariah* (Theology or Divinity) were also fitted into the same format. . .'*Magester*' and '*Doktorah*' are often heard and printed titles for Master and Doctor of Philosophy degrees in all the Universities. It is another one of those ironies whereby Arabic is scientifically known to be the richest language in the world with its structured potential to expand infinitely and to contain the largest number of words from its own root words, whilst academic titles are borrowed from other sources. (p.105)

The first university to be founded in Saudi Arabia was Riyadh University, now known as King Saud University. It opened in November 1957 with just 21 students (Ministry of Higher Education, 1982). Today Saudi Arabia has seven universities as well as 83 colleges and the number of students receiving higher education in Saudi Arabia had reached 222,000 by the academic year 1996-97 (Ministry of Planning, 1997). A measure of the government's substantial commitment to this sector is the allocation of approximately 19 percent of expenditure, or 37.5 billion US dollars, to education and human resources under the Fifth Development Plan (1990-94) (Ministry of Planning, 1995).

6.3.2 Governance and Administration of Higher Education

The governance and administration of higher education in Saudi Arabia was previously the responsibility of the Ministry of Education. However, the rapid expansion of higher education during the last two decades necessitated the establishment of a separate Ministry of Higher Education in 1975. Among the responsibilities of the newly established Ministry of Higher Education was raising the level of communication and co-ordination between the institutions of higher education. An additional function of the Ministry of Higher Education was to co-ordinate other governmental ministries and agencies in terms of their interests and needs in higher education. The government of Saudi Arabia regarded the Ministry of Higher Education and its institutions of higher education as change agents which could help guide the country's continuing development (Harthi, 1987).

It has also become the responsibility of this Ministry to co-ordinate the various types of higher learning programmes, to balance the growth of the different types of curriculum, and to ensure that the overall outcome will contribute to the general welfare and development of the country according to its Arabic and Islamic traditions (Saegh, 1983).

In 1994, the Higher Education and Universities Council was established by a Royal Decree to act as the highest administrative authority for regulating, co-ordinating, and supervising post-secondary education at all levels (Ministry of Planning, 1995).

It is the responsibility of the Ministry of Higher Education to make higher education accessible to every Saudi citizen who desires it and is able to fulfil the basic admission requirements. In addition to the conceptualisation, creation, and administration of colleges and universities in the Kingdom, the Ministry of Higher Education maintains educational missions in 32 countries. These missions are responsible for the education of Saudi students in the respective countries (Harthi, 1987).

At individual university level the Chancellor, who is appointed on the recommendation of the Minister of Higher Education with the approval of the Council of Ministers, has overall charge of the management of financial, educational, and administrative matters. The Vice Chancellors are appointed through a resolution of the Council of Ministers following a recommendation from the Chancellor of the university. They are appointed for three-year terms, which may be renewed. The Vice Chancellors assist the University Chancellor in the administration of university affairs. Each university has its own Board, which is headed by the Minister of Higher Education, assisted by the university's Chancellor. The University Board is the governing body of the university and consists of the Vice Chancellor, Deans of faculties, one professor from each faculty, nominated by the Chancellor for a two-year term, a representative of the Ministry of Higher Education, the Financial Secretary of State for the Ministry of Finance, two non-university members nominated by the Ministry of Higher education, and a technical adviser. Among other duties, the University Board is charged with creating new faculties, establishing curricula, scheduling examinations, regulating admissions, granting degrees, and appointing academic staff. The Board also manages and distributes university funds and establishes policies for study abroad (Faheem, 1982; Harthi, 1987).

Universities in Saudi Arabia are composed of academic colleges. The Dean of the College is appointed by the Minister of Higher Education upon the recommendation of the Chancellor of the University. The Vice Dean, however, is appointed by the University Chancellor upon the recommendation of the College Dean. Each college has its own Board which includes the College Dean as President of the Board, the Vice Dean, and the departmental chairmen. The task of this Board is to achieve the university's objectives within the college's limitations, to operate under the university's policies and regulations, and to prepare suggested proposals, future study plans, and budget requests, which must be presented to the University Board for review and approval. Finally, each department has its own Board which is headed by the Chairman of the Department, who is appointed by the University Chancellor upon the recommendation of the College Dean. The Department Board consists of the department chairman and the department teaching staff. The Board and holds periodic meetings (usually once a month) to review and discuss such matters as current curricula, proposals for innovations or expansion, etc., and to project future departmental needs over both the long and short term. All these proposals and suggestions are submitted to the College Board for approval. Some approved proposals are taken to the university level and others are taken one step further to the University Board, depending upon the magnitude of the proposals and the degree of their significance, and also upon whether final approval on these matters is the responsibility of the College Dean, University Chancellor, or the Minister of Higher Education. It also should be pointed out that major policies, plans, and proposals are submitted to the Council of Ministers for final approval (the highest executive authority in the country, which is headed by the King). Except for a few cases, the Council of Ministers very often agrees to delegate the authority to the Minister of Higher Education to carry out and undertake on its behalf the necessary actions (Saegh, 1983 p. 174).

As is evident from the above account, the running of the individual institution in terms of authority, power, and decision-making processes is highly centralised. Therefore the organisation of individual universities in Saudi Arabia have remarkable similarities because they are a function of the central government and are under the jurisdiction of the Ministry of Higher Education

6.3.3 Polices of Higher Education

In 1970, a paper on Saudi Arabian educational policy was published, outlining the task of higher education and the policies under which colleges and universities were to be administered by the Ministry of Higher Education. Educational policy in Saudi Arabia, in terms of determining the parameters of higher education, was to cover the following:

1. Higher education in Saudi Arabia was to start right after secondary school or its equivalent.
2. Public and private higher education in Saudi Arabia was to be under the jurisdiction of a higher education board.
3. Colleges and universities were to be established in accordance with the country's needs and resources, and to meet the needs of the communities they would serve.
4. Universities were to have a higher board whose system, authorities, responsibilities, and procedures would be set up.
5. Higher education was to be co-ordinated among various colleges so as to achieve equilibrium among the needs of the country in various fields.
6. Departments of higher education in various areas of specialisation were to be established whenever there was a need and a budget for them.
7. Colleges and universities were to maintain high academic standards and instruction in order to meet the needs of a developing nation.
8. Colleges and universities were to be held responsible for meeting the manpower needs of a developing nation

9. Colleges and universities were to provide instruction in Islamic philosophy, and students were to study this doctrine throughout their course.
10. Universities in the Kingdom should co-operate with other universities in Islamic countries to achieve the objectives of the Islamic nation in building a genuine Islamic civilisation.
11. Universities in the Kingdom should co-operate with universities in the wider world in scientific research, inventions, discoveries, and in mutual support, and should exchange useful research with these universities.
12. Libraries and translation departments should be given a special charge to develop knowledge for students and researchers (The Higher Committee for Education Policy, 1970, pp. 25-26).

6.3.4 Major Goals of Higher Education

According to The Higher Committee for Education Policy (1970), higher education is regarded as the stage of academic specialisation for competent and gifted students. It is envisioned that, through the process of higher education, students will develop their talents and fulfil the various present and future needs of society. Specifically, the Ministry of Education (1978) gives the following objectives for higher education in Saudi Arabia:

1. Providing the student with Islamic education to emphasise his faith in God and provide him with further Islamic education to make him feel responsible for his Islamic nation and put his practical and scientific capacities into fruitful and useful action.
2. Preparing competent and highly intellectually and scientifically qualified citizens to perform their duty in the service of their country and the progress of their nation in accordance with the principles and ideology of Islam.
3. Providing gifted students with the opportunity to continue higher education in all the fields of academic specialisation.
4. Enabling students to participate in scientific research and contribute towards progress in the arts and sciences and finding sound solutions to technological problems.

5. Promoting writing and scientific production in order to bring the sciences into the service of Islamic thought so that the country can perform its leadership role in building human civilisation on Islam's principles.
6. Translating works of science and other useful writings into the language of the Quran and enriching the Arabic language with new expressions to fill the need of Arabicisation, and putting knowledge at the disposal of the largest number of citizens.
7. Offering training services and re-orientation courses to enable graduates who are already working to keep pace with the new developments (pp. 21-22).

6.3.5 The Structure of the Higher Education System

This section gives a brief description of the structure and classification of the higher education system in Saudi Arabia by purpose and design. Higher education in Saudi Arabia comprises two major segments: mainstream university education, and scholarship programmes abroad.

6.3.5.1 University Education

Based on their purposes and types, universities in the country could be classified into four different groups: comprehensive, Islamic-oriented, technology-oriented, and female-oriented institutions.

Comprehensive institutions, as the name suggests, provide various types of scientific, artistic, humanistic, and professional programmes of study. In Saudi Arabia there are four universities of this type. These are King Saud University, King Abdul-Aziz University, King Faisal University, and Umm Al-Qura University.

All these universities provide architectural education within their programmes of study. Moreover, these institutions provide education for female students,[29] but through the

[29] Admission to architectural schools in Saudi Arabia is limited to male students only (See Chapter 7).

system of maintaining two separate university campuses, male and female university students are kept segregated throughout their university education. Educational facilities, staff, teachers, and students are, therefore, separated along gender lines. Lectures given to female students by male members of the teaching staff is limited to closed-circuit television only.

The Islamic-oriented institutions place a great emphasis on Islamic and Arabic language studies. Religious studies cover Islamic law (*Shari'a*), the sayings of the Prophet Mohammed (*Hadith)*, religious principles, jurisprudence, and studies from the holy book (Quran). Two of the Saudi universities specialise in religious studies: Imam Muhammad Bin Saud Islamic University in Riyadh, and the Islamic University in Madinah.

King Fahad University of Petroleum and Minerals is the only institution in the Kingdom that is technology-oriented. Its curriculum emphasises technical and scientific studies, especially in the sector of petroleum and minerals. This university provides for architectural education within its College of Environmental Design.

In addition to the comprehensive universities that were made available for female students, the Presidency of Female Education has recently established a General Directorate for Girls' Colleges. Its responsibility is to supervise higher education for women within the Presidency, and to undertake various projects 'aimed to expand women's opportunities for higher learning suitable to the natural role of the female' (Ministry of Planning, 1997, p. 311).

At present, there are seven universities in Saudi Arabia administered by the Ministry of Higher Education. There follows a brief description of the seven universities designed to give a basic overview of their respective areas of study at undergraduate level in academic year 1997-98.

King Saud University

King Saud University (KSU) - formerly Riyadh University - was, as we have already noted, the first university in the Kingdom. It was founded in 1957 and represents Saudi

Arabia's first commitment to the development of higher education. It is located in the capital, Riyadh, in the central region of the Kingdom. The University is the largest university in the Kingdom, having 16 colleges in 1997-98 with a total enrolment of more than 41,036 (King Saud University, 1997). It offers 123 undergraduate majors and graduate degrees in 21 academic majors. The university's new campus in Riyadh, inaugurated by King Fahad Bin Abdul-Aziz in December 1984, was built at a cost of SR 5.7 billion (U.S. $1.56 billion). The campus has housing facilities for up to 45,000 students and teaching staff (King Saud University, 1995).

The Islamic University

The Islamic University at Madinah, founded in 1961, serves as a regional centre for Islamic studies and attracts many foreign students, which is a unique feature of this University. Currently, the University consists of five colleges, which are all Islamic oriented. Students at the Islamic University can study for degrees in such fields as linguistics, Islamic Law, Quranic Studies, and Islamic Literature.

Imam Muhammad Bin Saud Islamic University

Imam Muhammad Bin Saud Islamic University was founded in 1974 in Riyadh. The University specialises in Islamic studies, teacher education, and Arabic language and literature.

King Fahad University of Petroleum and Minerals

Located in Dahran near the oil producing areas of the Kingdom, and founded so that the areas of oil exploitation and mining could be adequately served by qualified personnel, this University started in 1963 as the College of Petroleum and Minerals (CPD), and in its earliest days had links with the oil company ARAMCO. The College was given university status and renamed the University of Petroleum and Minerals (UPM) in 1975, and it was renamed King Fahad University of Petroleum and Minerals (KFUPM) in 1986. Since that time, the University has been responsible to the Ministry of Higher Education. At present it consists of six colleges with a total enrolment of 9,416 students, a considerable proportion of them non-Saudis (Ministry of Planning, 1997).

The original CPD was modelled totally after the American educational system and the University uses the American system in all matters, including planning, organisation, and curriculum. English is the language of instruction (Jan, 1983).

The University offers undergraduate courses in various petroleum and mineral studies as well as in architecture and engineering.

King Abdul-Aziz University

King Abdul-Aziz University (KAU) in Jeddah in Western Province of the country was founded in 1967 by a group of Saudi merchants who realised the importance of education in national development. The University developed so rapidly that, in 1971, the founders petitioned the government to assume responsibility for its operation and it came under the jurisdiction of the Ministry of Higher Education.

King Abdul-Aziz University in Jeddah has 10 Colleges with an enrolment of 42,576 students in 1997-98 (Ministry of Higher Education, 1998).

The academic programs at KAU are similar to those at KSU. KAU offers undergraduate degrees in the fields of arts and humanities, administration and management natural sciences, engineering, architecture, planning, medicine and medical sciences, and education. In addition, it has a Faculty of Navigational Sciences reflecting Jeddah's historic link with the sea. The recently established Faculty of Meteorology and Environmental Sciences has also gained renown for its work in monitoring environmental pollution in the Jeddah area.

King Faisal University

King Faisal University (KFU) was established in 1975 in Dammam in the Eastern Province. With five colleges, it offers undergraduate degrees in Engineering, Architecture, Planning, Medicine and Medical Sciences, Agriculture and Veterinary Medicine, and Education. It has a total enrolment of 2,209 students. (King Faisal University, 1992)

Umm Al-Qura University

Umm Al-Qura University (UQU) is the most recent addition to the universities in Saudi Arabia. It is located in the holy city of Makkah and is composed of some of the Kingdom's oldest institutions of higher education. The roots of Umm Al-Qura University date back to the *Shari'a* College (The College of Islamic Law), founded in 1949, and the Teachers' College established in 1952. These two colleges were combined in 1960-61 to become the College of *Shari'a* and Education. In 1971, this college became affiliated with KAU in Jeddah and in 1981 a royal decree established the college as an independent university, giving it the name Umm Al-Qura University.

Approximately 12,000 students are currently enrolled in the seven academic departments, and although the main focus of the University is on religious studies it offers undergraduate degrees in Islamic Studies, Arts and Humanities, Natural Sciences, Education, Engineering, Architecture, and Medicine and Medical sciences (Umm Al-Qura University, 1997).

6.3.5.2 Scholarship Programmes Abroad

Finally, to complement their studies in universities in the Kingdom, Saudi students have the opportunity to pursue graduate and postgraduate degrees in specialised fields abroad. Thus the scholarship programmes of Saudi Arabia are a major feature of the higher education system. The major purpose of the scholarship programmes is to supply the Kingdom with highly specialised trained and skilled manpower and leaders, and indeed Saudi teachers in architecture schools have all gained their Ph.D. under this system. The emphasis is particularly on graduate or advanced studies and on scientific fields such as medicine, architecture, engineering, and technology. Scholarship programmes abroad are an integral part of the responsibilities of the Ministry of Higher Education. In each host country there is an office for the Saudi cultural attaché. These offices are mainly responsible to the Ministry of Higher Education. Their function is largely to provide required services and supervision over Saudi students abroad, with the cultural attaché being responsible for day-to-day operations. However, the Ministry of Higher Education must approve most major policies and decisions. Major academic decisions for students sponsored by various government agencies must also be sent to the agency concerned for final approval.

6.4 Summary

In the days before the establishment of the Kingdom of Saudi Arabia basic education was delivered in the form of *Kuttab* (Quran recitation) classes and other elementary classes. During the period leading up to the final establishment of the Kingdom in 1932 and in the years that followed, provisions were made for the establishment of a more organised and formal general education system, largely following the initiative of King Abdul-Aziz.

In more recent years there has been rapid development of general education, such that the literacy rate jumped from one of the lowest in the region to one of the highest in the years from 1970 to 1990.

General education – covering primary, intermediate, and secondary education and providing for the ages 6 to 18 – is now run by the Ministry of Education and (for female pupils) the Presidency of Girls' Education.

In the context of architectural education, it should be noted that art and other architecture-related subjects are not taught in schools, and drawing classes stop after intermediate school. The organisation of secondary education in Saudi Arabia encourages pupils to memorise information from textbooks for examination purposes, rather than to think for themselves or to understand, assimilate, and integrate the knowledge they are exposed to. This tendency to compartmentalise has been remarked upon by several of the researcher's interview respondents. It has been identified as one of the factors inhibiting the ability of students who go on to take architecture courses to integrate in the design studio the subject information they are taught.

In high schools pupils are divided into those concentrating on science subjects and those concentrating on arts and humanities. Students to architecture courses are admitted only from the science stream.

With general education well established the Saudi government was able to turn its attention to higher education, in order to meet the need for trained professionals in various fields in response to the expanding economy of the country. Until the 1950s Saudi students had pursued higher education outside the Kingdom, but in 1957 the first Saudi University (now KSU) was founded in Riyadh. From this start, higher education in Saudi Arabia has now expanded to seven universities and some 80 colleges. The academic organisation of Saudi universities tends to follow western, in particular American, models, since much of the early input in terms of teaching staff and administrative advice was from the United States.

The goals of higher education in Saudi Arabia include training, within an Islamic framework, scientists and other professionals to fulfil the requirements of Saudi society, and to participate with other academic institutions both within and outside the country in academic and scientific enterprises.

Higher education is free for both male and female students who have the academic ability. Financial assistance is also given in matters such as books, meals, accommodation, and transport.

The government agency responsible for higher education is the Ministry of Higher Education, which came into existence as a separate department in 1975. Its establishment was a reaction to the expansion in higher education, which in itself was related to the development of the Saudi economy and the country's integration into world markets. Higher education in Saudi Arabia may be described as a highly centralised type of education, since it is basically run by the Ministry.

The universities are organised into colleges, with the head of each university being the Chancellor. Although the colleges enjoy a measure of independence within the university, and the universities have a measure of autonomy in themselves, the structure and organisation of individual universities in Saudi Arabia show considerable similarities since they are essentially functions of the Ministry of Higher Education. Most major decisions relating to policy are made at Ministry level.

There are various types of university in Saudi Arabia: comprehensive institutions providing various types of scientific, artistic, humanistic, and professional programmes of study, of which there are four; Islamic-oriented institutions placing a great emphasis on Islamic and Arabic language studies, there being two such universities in Saudi Arabia; and King Fahad University of Petroleum and Minerals, the only institution in the Kingdom that is technology-oriented. The origins and development of each of the seven universities have been detailed.

Chapter 7
Architectural Education in Saudi Arabia

7.1 Introduction

This chapter discusses architectural education in Saudi Arabia, giving a detailed analysis of such education in terms of the general features that characterise it, both structurally and incidentally, and which may be observed to a greater or lesser extent at the five schools which provide it.[30]

The emergence of the Saudi architecture schools is set against the background of the previous architectural training tradition in the country and the development of Saudi Arabia in economic terms. The origins and development of each of the Saudi schools are described, along with some of their distinctive features.

This chapter also looks critically at the aims and objectives of each of the five architecture schools, asking whether these aims and objectives are clear and whether the curricula are able to meet them.

An account of the sort and numbers of students attending architecture schools in Saudi Arabia is given, against the background of higher education in the Kingdom. Particular attention is given to the type of student admitted to architecture schools and to the admissions policies of universities, with comments offered by interview respondents on the situation. The schools are compared in terms of relative students numbers.

[30] Within this study in general, although it is particularly noticeable in Chapters 7 and 8, the initial letters of the names of architecture subjects have been capitalised when they are used as the names or titles of courses, subjects groups, programmes, etc., and have not otherwise been capitalised except when demanded by the general rules of English orthography. Thus there may be found, for example, 'We were taught Structure only on the blackboard', but on the other hand, 'We did not know enough about structure when we did our design project'. The fact that, especially in quotations from interview respondents, it is not always easy to decide which sense of a term is intended, has not always made this convention easy to apply.

In looking at the teaching staff in the Saudi architecture schools, particular attention is paid to the isolation from practice that is caused by the fact that teachers cannot practise and practitioners cannot teach. This is identified by many as a major cause of the education/practice gap.

This chapter also examines the physical academic resources in the Saudi architecture schools, primarily looking at the library, workshop, and lab facilities they provide, but also considering the general environment they offer to students.

As well as academic training this chapter investigates the practical training system in Saudi Arabia. This is universally regarded a completely inadequate, and as a major contributing factor to the inability of new architecture graduates to cope with the world of practice.

Course duration and structure are also examined. The chapter offers a discussion of the comparatively short duration - five years - of the architecture courses in the country and analyses in real terms the number of credit and contact hours[31] that are actually spent on architecture subjects in the five schools.

7.2 The Emergence of Schools of Architecture

Before the introduction of formal university-based architectural education in Saudi Arabia, a form of architectural training existed which fitted the general pattern of the traditional apprenticeship system that operated in earlier days in various countries (See Chapter 3). In the past, architects in Saudi Arabia were called master builders *(Mu^{c}alimin)*. The *Mu^{c}alim* was required to go through several years of training, in

[31] The credit system developed in the US colleges and universities – and used elsewhere such as in the UK' Open University – is one in which a student has to obtain a given number and type of credit to qualify for the award of a degree. A credit hour is a unit used in measuring and recording quantitatively the work completed by a student (usually one credit hour represents one hour of classroom instruction per week in a given subject for a designated number of weeks in the term). This system facilitates the transfer of credits and acceptance of students of one institution of higher education by other institutions. Credit hours, hence, are simply a 'weighting' element in the curriculum design and they do not *necessarily* reflect the actual time of instruction spent by students on the subjects concerned. Contact hours, however, *are* accurate reflections of the actual time of instruction spent on a subject.

effect an apprenticeship, before the chief of builders *(Shaykh al-Muᶜalimin)* would allow him to create a building by himself. He began his training by carrying small stones and light local building materials, and then by working as a mortar mixer *(ᶜAajjaan)*. After mastering these jobs, he learned to cut the stones. After several years spent mastering primary skills and knowledge about building designs, materials, and technique, he became a builder *(Banna')* after which he had to work under the supervision of a master builder until he established a reputation for himself (Fadan, 1983).[32]

It was the economic expansion that the Kingdom of Saudi Arabia experienced in the 1970s and up to early 1980s, which was associated with many physical as well as cultural changes (See Chapter 5), that led to the need to establish a number of modern schools of architecture. These changes were features of the overall development which was achieved by means of National Five-Year Development Plans. These plans, which are still underway, were designed to establish mechanisms for the co-ordination and implementation of the programmes of individual government agencies and the private sector in the light of the increasing scale of development and the potential constraints due to the inadequacy of the infrastructure and the shortage of manpower, as well as any temporary financial inhibitions which might at times hinder the pace of growth.

In 1967, as we have already noted, the first Saudi school of architecture, indeed the first architecture school in the Arabian peninsula, was founded within the College of Engineering (See Fig. 7.1). In 1969 the school joined the University of Riyadh, (now King Saud University). From its inception, the school was based upon the Egyptian schools of architecture. Ahmed Fareed Mustafa, the first head of the School, was an Egyptian professor, and he was the main planner of the Department as far as structures, courses, etc., were concerned. Naturally, he followed the pattern that he was familiar

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[32] Some master builders were also apprenticed in countries such as Persia, India, etc. (See King, 1998).

with, the Egyptian system[33] (See Chapter 4). Major changes took place in 1975, when Rice University (Texas, USA) was consulted to develop the KSU school. The American semester system was adopted in place of the traditional academic year, and the Department of Architecture was transformed into the College of Architecture and Planning. The College now has two departments, the Department of Architecture and Building Science, and the Department of Planning and Urban Studies.

King Faisal University (KFU) in Dammam saw the establishment of its Department of Architecture in 1975-76 (See Fig. 7.2). The curriculum was developed primarily by the college's first dean, Ahmed Fareed Mustafa, who had previously been the head of the Department of Architecture at KSU, and indeed the curriculum resembled that of KSU.

Consultants from Rice University were later involved in the design of the architecture programme at KFU, as they had been in KSU. An architecture teacher at KFU, Lyali (interviewed 1998) describes what happened:

> In 1984 the University of Rice in Texas, USA, was consulted to design a new architecture programme. This programme was five years and a half long, and it was similar to the previous one . . . They added some subjects, and removed some, and extended the programme by half a year.

The Department of Architecture exists alongside four other related departments at KFU, the Department of Urban and Regional Planning, the Department of Building Science and Technology, the Department of Landscape Architecture, and the Department of Interior Design. Initially all these five departments were one single architecture department, with specialists in other disciplines such as structure, mechanical engineering, etc. engaged as integral parts of the architecture programme and instructing in the design studios, but they became fragmented when Saudi teachers, returning with Ph.D.s, sought to establish their own specialist departments (Lyali, interviewed 1998).

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[33] One factor of the Egyptian influence on Saudi architecture schools is that schools of architecture in the country have always been part of, or associated with, colleges of engineering, rather than colleges of art, and not even the American influence has been able to change that. No art or craft classes are offered in any in the curricula of Saudi architecture schools; indeed the need for such classes has not even been mentioned by any of the interviewees. Further, as we shall see, the admissions policy to schools of architecture resembles that of Egypt in the sense that schools of architecture accept students with secondary education science backgrounds rather than humanities backgrounds.

This disintegration of the department at KFU is one factor that is commented strongly upon by interviewees, as we shall see in Chapter 8.

Once again there was direct American involvement in the establishment in 1976 of the architecture school at King Abdul-Aziz University (KAU) in Jeddah (See Fig. 7.3). Tarim, an architecture teacher there (interviewed 1998) states:

> The programme in the School of Architecture was designed by Morris Cambridge of Harvard University, who advised that there should be co-ordination between the different subjects of the curriculum and advocated the design studio as the practical location where all these subjects should be integrated.

The School was founded as the School of Environmental Design within the College of Engineering. It consists of three departments: the Department of Architecture, the Department of Urban Design and Planning, and the Department of Landscape Architecture.

The architecture school at King Fahad University of Petroleum and Minerals (KFUPM) in Dahran was established in 1980 as the College of Environmental Design with three departments, those of Architecture, Architectural Engineering and City Planning (See Fig. 7.4). Originally conceived as a technical university, KFUPM had a Department of Architectural Engineering within the College of Engineering. This Department was absorbed into the new College of Environmental Design.

The curricula of the architecture departments of these four universities have been, by and large, imported from abroad and are not indigenous. This is one element that has contributed to the gap between education and practice in Saudi Arabia. Commenting on this issue the teacher Haikal (interviewed 1998) states:

> We are now following in our curriculum methods that used to be used in Beaux Art and Bauhaus sixty or seventy years ago . . . We teach these things as they are without thinking about the environment and the culture of the region. This has two flaws. The first one is that we have not used these techniques selectively, taking and using the elements which were best suited to us. The second flaw is that when we imported these traditions we did not bother to develop them.

The teacher Akbar (interviewed 1998) is also aware of a curriculum weakness in trying to impose foreign values on a Saudi environment:

> I would like to ask you a question. If you have a tropical plant, can you grow it at the North Pole? The logical answer would be no, unless you create the conditions for it. Architectural practice is an amalgam of contributions from various parts of the world, and architectural training is likewise an amalgam of contributions from various countries, so that the two are not dovetailed with each other to start with. Furthermore we then try to transplant them to Saudi soil, and they do not take to the local environment. So as an answer to your question, yes, there is a gap.

Furthermore, as we have seen in Chapter 5, practice in the country is not properly organised; this, combined with the fact that the curricula are foreign to Saudi Arabia, means that the two do not combine well and have become one more factor in the maintenance of the gap. The architecture practitioner Kamel (interviewed 1998) states:

> The practices the student are taught in the schools in our universities are all imported from abroad, and they are not harmonious with our environment. Also, the identity of our contemporary architecture is in a state of uncertainty, which doesn't help the situation at all. Now we teach architecture by means of imported curricula from the west. When the students specify materials for a project, they specify materials in such a way that have to be imported from abroad, because that is all they are familiar with. They cannot specify materials that are available locally, and can be made by local craftsmen.

Several interviewees believe that the curriculum does not deal fully enough with local matters or matters particular to Saudi Arabia, or that it ignores the Arab/Islamic tradition in architecture. Indeed one practitioner, Aba-Al-Khail (interviewed 1998), goes so far as to say that the entire curriculum is unsuitable for Saudi Arabia, having been imported from outside, and that this is the reason for the gap between architectural education and practice:

> Architectural curricula in our schools of architecture are not home grown. They were imported from abroad. That is why education and practice are not dovetailed in this country.

Comments on the imported nature of the curriculum content and its relation practice in Saudi Arabia are frequent from the interview respondents, as will be seen in greater depth in Chapter 8.

The most recent architecture school to be set up in Saudi Arabia is the School of Islamic Architecture of Umm Al-Qura University (UQU) in Makkah. It was established in 1983-84 as a department in the College of Applied Sciences and Engineering to be part of a group of future engineering departments planned to develop into a separate college (See Fig. 7.5).

Since UQU had been established as an Islamic university, the aim was to establish an architecture school which conformed to the ethos of the wider institution. Therefore the school of Islamic Architecture did not at first follow the patterns followed by the other Saudi architecture schools. Hence it did not consult western experts but rather consulted experts in Islamic architecture from other Saudi universities. A committee of experts was formed which was headed by Dr Mohammed Hossein Ateshin, Professor of Architecture at KAU at the time. He has expressed the founding philosophy of the UQU architecture school in this way: 'It attempted to have contextual as well as structural relevance to the ideas embodied within the concept of Islamic architecture.' (Ateshin, 1987, p.116)

The UQU architecture teacher Hariri (interviewed 1998) describes at length how there was a conscious effort to give the UQU school a different style and structure from those following western academic traditions:

> In the School of Islamic Architecture at Umm Al-Qura University when the curriculum was originally designed it was designed with the intention of reducing this gap. It was intended that *architectural training should be carried out in the design studio* and not through credit hour courses . . . The Department was supposed to show a new philosophy of architectural education, with many positive aspects.
>
> It was designed in units, each academic year having two units. Each unit had a specific project for a student to design in the studio, and the project, as the students progressed, was to get more complicated.

> Each unit was to have a team of instructors, with the design studio instructor the leader of the team, and the team members drawn from different architecture disciplines such as structural engineering, building science, construction, mechanical and electrical engineering. And these teams were to teach the students within the studio, and to transmit to them only such information as was relevant to the project being undertaken.
>
> Also it was supposed to have the year before the graduation project as a one-year Professional Practice Unit. This was to be in an office set up in the School just like a professional practice office, where the student would work with the office staff, and get a live project from real clients. This office would have its own administration and budget like any other office. The student was supposed to learn the day-to-day practice of architecture in a real office environment. (Researcher's italics)

In another response Hariri (interviewed 1998) states:

> There was also supposed to be within the School of Architecture a research centre the function of which was to develop the curriculum for and knowledge of architecture, so that the curriculum would have been devised in an informed and constructive manner, and would have driven towards its educational goal. Now the curriculum and the subjects seem to follow arbitrary paths, according almost to the whim of the individual teachers.

The proposed new structures, however, never really got under way, and the holistic approach to architectural education in the Kingdom was frustrated. Hariri (interviewed 1998) explains:

> However, this was a proposal only on paper and has never materialised. There were many obstacles that stood in the way of this proposal. At the beginning the subjects within each unit were altered to credit hour courses . . . and there was no co-ordination between the subjects and the design studio. . . The credit hour courses motivate the student only to pass the course exam; these courses have fragmented the holistic approach to architectural education into separate courses with no apparent connection between them.

Hariri states further:

> Also, there was not enough teaching staff to support the units. As for the proposed teaching office, there were financial and administrative obstacles that stood in the way of its creation. There

> was no financial support from the University for the setting up of the office, and administratively no one in the teaching staff was willing to take responsibility for the work produced by the office.

Eventually, in 1989, the school was forced to succumb to the pattern of the other architecture schools in the country. Instead of remaining an independent school of architecture it became, as the Department of Islamic Architecture, part of UQU's College of Engineering and Islamic Architecture, with the Department of Electrical Engineering and Computing, the Department of Civil Engineering, and the Department of Mechanical Engineering, as co-departments within the College. The school's programme was redesigned by the Egyptian Faud Faramawi, a professor of architecture at UQU at the time, to follow the Egyptian model with credit hours, and to be part of the Engineering College instead of UQU's School of Art. There is thus still no architecture school in Saudi Arabia that is part of a school of art as opposed to an engineering school.

Fig. 7.1: The School of Architecture, King Saud University (exterior, design studio, structural lab, and computer lab).

Fig. 7.2: The School of Architecture, King Faisal University (exterior, interior, lecture hall, and computer lab).

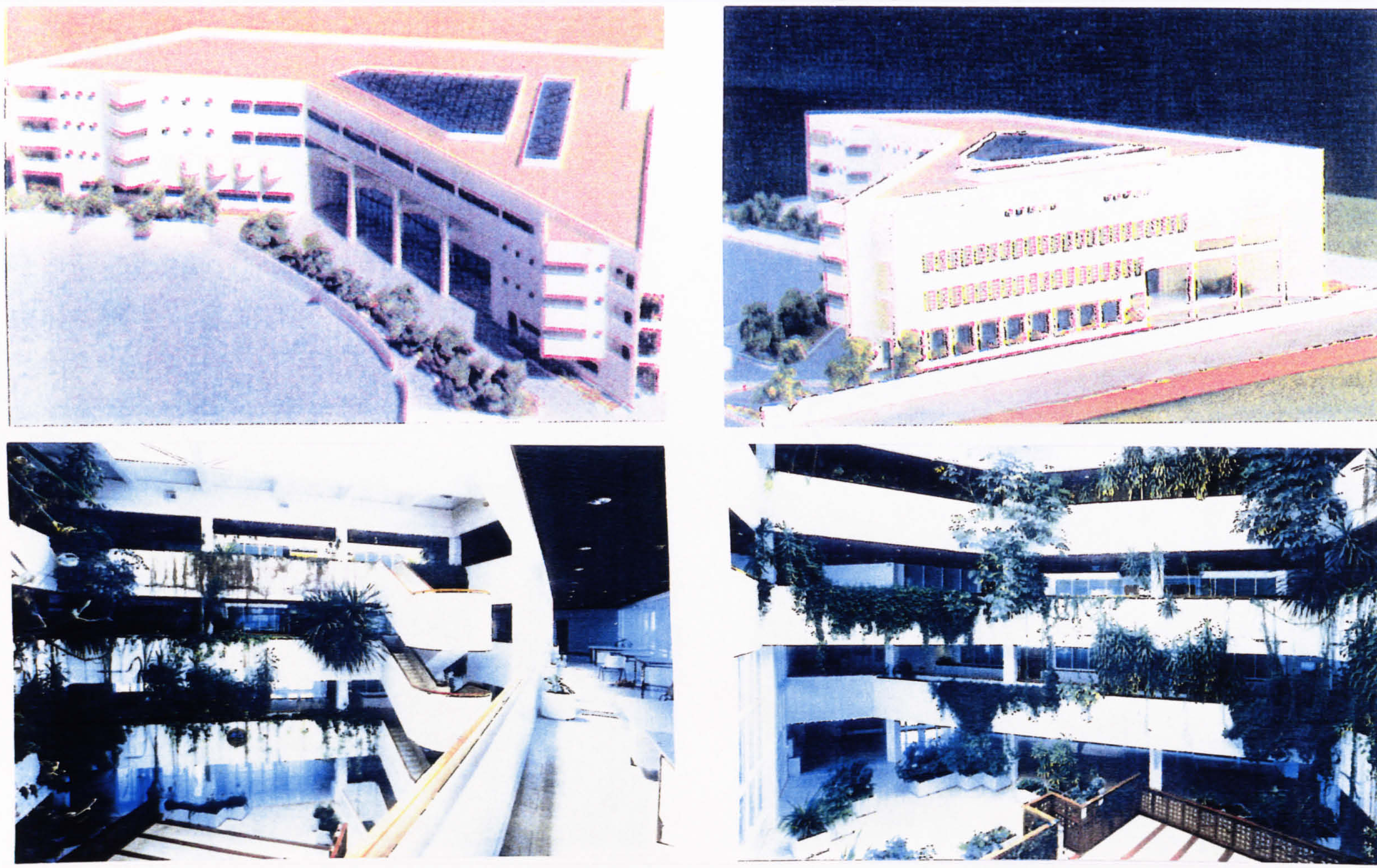


Fig. 7.3: The School of Architecture, King Abdul-Aziz University (exterior, and interior court).

Fig. 7.4: The School of Architecture, King Fahad University of Petroleum and Minerals (exterior, design studio, library, and workshop).

Fig. 7.5: The School of Islamic Architecture, Umm Al-Qura University (exterior, design studio, computer lab, and structural lab).

7.3 Aims and Objectives

As far as the aims and objectives of the Saudi architecture schools are concerned, the feeling is articulated by several interview respondents that the architecture schools lack clearly stated aims and objectives. For example the KSU student Jamaz (interviewed 1998) complains: 'We feel that the college has no lucid goals towards which the students are directed. What is happening now is an individual effort by the teachers.' This view is supported by the remarks of the KSU teacher Haikal (interviewed 1998):

> We are supposed to look upon the School of Architectural Education as a school of thought that has a direction and a trend that it tries to follow. . . What is actually happening now is that each teacher is acting on his own in complete isolation from the others.

Haikal compares KSU with schools of architecture in the USA, where aims and objectives are commonly clearly identified:

> After his appointment, the new dean then brings in other players to form his team, and they sit down together and discuss the objectives of the school and the best way to achieve them.

It is not only architecture schools as a whole that are thought to lack direction. Individual subjects are also considered by some to be taught without clear aims and objectives. Barhamain (interviewed 1998), an architecture teacher at UQU, explains:

> Another shortcoming of the programme in Umm Al-Qura University is that there is no fixed syllabus for each subject, so that each teacher sets the syllabus himself. Thus, if a different teacher is teaching the same subject the following year, the students he teaches may in fact receive instruction on quite different things from the students who were taught by the other teacher. So there is a sense of discontinuity in the subjects. For example when I started to teach the Professional Practice course it was difficult because there was no syllabus for me to follow, or any indication of the educational objectives of the course. There were no guidelines. So I sat down and wrote out the content of the course, and when I compared it with the course taught by the previous instructor it was completely different.

And Ashi (interviewed 1998), a student at KAU, says: 'During the studio work there were no educational objectives which had to be covered before we could move on, such as building design standards.'

In order to verify the claim by some respondents that architecture schools lack coherent aims and objectives, we shall examine below the aims and objectives of the five schools of architecture in Saudi Arabia, using each university's catalogue as the source.[34]

King Saud University

The most recent College Catalogue of 1998 did not include a section on aims and objectives. A brief statement, however, which could be understood as indicating these aims and objectives was given in the introduction and reads as follows:

> The aim of the five-year architectural program of the department is to encourage and develop students who exhibit creative ability to grasp and use scientific principles for professional careers in the design and building science. (p. 2)

This did not seem fully satisfactory, so the researcher was compelled to consult previous catalogues to find more material on the school's aims and objectives. In the 1996 Catalogue this short passage was found where the aims of the school were articulated more fully:

> Its [the Department's] main goal is to respond to the manpower needs of the Kingdom for architects who can assume responsibilities in the areas of design, research and construction management. (p. 1)

The 1996 Catalogue also states:

> The ambition of the plan of the department is to accomplish the following:
>
> - To produce graduates who have well developed architectural design abilities and who are concerned with the critical evaluation of architectural design solutions for use in future design.

[34] Aims and objectives are really the heart of a school and deserve to be treated historically at greater length; however, this is outside the scope of this thesis. For our present purposes we shall look at the current catalogues and go back to previous catalogues if there is no helpful current material.

- To produce graduates who take cognizance of all relevant contextual, physical, sociological, cultural and economic factors bearing on a problem and who are aware of the impact of architecture and construction on society.
- To produce graduates who are able to manage both the design and construction processes to ensure the satisfactory completion of the project. (pp. 3-4)

When the Catalogue for 1986 was consulted, the researcher was surprised to find that the aims and objectives of the school were set out in exactly the same terms, with the exception of the *additional* ones listed below:

- To develop in students the ability to:
- Gather appropriate data for a problem, analyse it and synthesise a design solution which can be converted into an artefact.
- Critically evaluate an existing project from the aesthetic, technological, economic, cultural, and sociological viewpoints.
- Integrate the specialist inputs from other professions in the solution of a design problem.
- Consider the long-term effects of their design solutions on the users and society at large, with particular emphasis on flexibility in a changing society.
- Communicate effectively their ideas, feelings and proposals through visual, oral, and written methods.
- Plan, program and organise the physical execution of a design solution at the micro and macro level.
- Appraise the effective management process for an independent architectural practice and an architectural division of a Government Department.
- Use current Information Technology to enhance both the design and construction process. (p. 10)

<u>King Faisal University</u>

The most recent Catalogue for KFU dates from as far back as 1992. When this was inspected, it was found that there were no aims and objectives specific to the Department of Architecture. There were, however, aims and objectives for the college of Architecture and Planning as a whole.

A list of areas in which the College aims to encourage the student's development is stated in the 1992 King Faisal University Directory as follows:

- Identifying with values and traditions.
- Communicating professionally in Arabic and English.
- Thinking logically and developing skills of analysis, synthesis, and linking theories to application.
- Gaining an understanding of the related fields of environmental design.
- Acquiring a perspective on architectural theories of past and present with emphasis on those of Islamic and Arabic architecture.
- Learning about building technology and acquiring the necessary skills in engineering science.
- Understanding of professional practice in design and management in Saudi Arabia.
- Gaining an understanding in the social, sanitary, and economic factors in design. (p. 6)

Precisely the same set of aims and objectives features in the College Catalogue of 1982.

King Abdul-Aziz University

According to its Catalogue the aims and objectives of KAU's School of Environmental Design, 1998 are these:

> The goals of the School of Environmental Design may be characterised as follows:
>
> - The refining of skills and knowledge in the field of environment designs for young Saudis studying architecture, environmental architecture, and urban and regional planning. The approach is directed towards creating highly skilled and capable specialists in those fields who can take their part in planning, developing, and building a well-balanced architectural environment. The emphasis of such an environment will be on harmony with the needs of individuals and society in Saudi Arabia.
> - The continuation of the development in the Kingdom of higher education and the enhancement of the cultural awareness of students through their exposure to scientific, technical, and vocational knowledge. The School encourages students to use the knowledge they acquire in creating a better social, physical, and spiritual environment.

- Paying due attention to Islamic culture and values by taking them into account, directly or indirectly, when designing the architectural environment. In order to create appropriate awareness amongst students, the School's courses relating to Islamic culture and civilisation lay emphasis on the concept of Islamic heritage in the architectural environment of the Kingdom of Saudi Arabia in particular and in the Muslim world generally. This acts as an aid to the students in identifying the elements of around them that are characteristic of their Islamic heritage, so that they may preserve and develop those elements with the aid of the latest scientific and technological techniques.
- Developing the vocational and scientific skills applicable to environmental design through scientific research and through Arabicisation.
- Playing a role in the wider community by holding special courses, seminars, and scientific conferences designed to increase awareness of the profession. The school is also concerned to emphasise to society in general the advantages of specialised professional services in the three areas of environment design.
- Consolidating the vocational links between the three areas of environmental design so that students in any one area acquire sufficient knowledge of important aspects of the other areas. (pp. 7-8)

The aims of the study programmes are laid out thus:

- To participate in realising the University's goals in relation to university education and to service to society.
- To realise the goals of the School of Environmental Design as detailed above.
- To promote the vocational skills that the students will require after qualification.
- To maintain the programme's strength and aspiration to be an innovative and comprehensive educational course.
- To maintain the coherence of the curriculum as a well-designed presentation of serial progression from one level of learning to another and its integration with the other regular school programmes.
- To organise the common subjects amongst the departments in such a way that the students are offered appropriate vocational education in the three areas concerned.
- To be abreast of scientific and technological developments in the areas of environmental design and to transmit them to the students so that they will be well equipped to contribute to the country's development. (pp. 8-9)

Unlike the two previous schools we have discussed, KAU has specific stated aims for the Department of Architecture. These goals are set out as follows:

- Producing architects with the capacity to carry out their responsibilities following graduation. This will be done through a programme that concentrates on the theoretical aspects and skills involved in design as well as its practical application in the actual process of building in the developing construction situation both in Saudi Arabia and the wider world.
- The Department aims too at broadening the intellectual awareness of the students of the spiritual and physical dimensions of their design activity, so that they can create a well-balanced architectural environment.
- Creating a distinct local architectural identity and local architectural trends through scientific research and the provision of consultations in the field of architecture and construction, and the production of books, translation initiatives, and Arabicisation.
- Boosting architectural awareness in the population at large so as to preserve the indigenous traditional architectural environment, together with finding the means to develop the contemporary architecture environment in a way that is both appropriate and that fulfils future needs and capacities.
- Co-operating with other departments and agencies in all matters relating to architecture and construction, and exchanging expertise locally and internationally. (p. 11-12)

<u>King Fahad University of Petroleum and Minerals</u>

The University Catalogue of the year 1995-96 defines the aim of College in the following terms:

> The College was established to aid in meeting an intense demand for professionals required for the extensive program of construction that exists throughout the Kingdom of Saudi Arabia. The College was planned to bring together those design professions that are concerned mainly with the built environment; it deals with both the natural and the man-made aspects of this environment, and prepares students for the professional practice of design on the different scales of this environment. (p.95)

The Catalogue outlines the philosophy of the college as follows:

> The educational philosophy of the College of Environmental Design, as the name of the college itself suggests, is to develop

> interdisciplinary relations between the design professions that share a common concern for the design of the built environment. In recognition of this commonality, the College has been organized as one school with a shared common purpose and not merely as an assemblage of departments. The realization of the philosophy comes with allowing students, whatever their chosen speciality, to share common knowledge and common classroom experiences through shared environmental design courses. (p. 98)

The Catalogue give this statement regarding the aims of the programme of the Department of Architecture:

> The ultimate goal of the professional Architect is to program, plan, design, and supervise the construction and maintenance of buildings of all kinds that suit the needs of human society, and improve its living conditions and its physical environment. (p. 98)

<u>**Umm-Al-Qura University**</u>

The Catalogue of UQU Department of Islamic Architecture, 1998 states:

> The Department of Islamic Architecture is one of the most ambitious departments of the College of Engineering and Islamic Architecture at the University of Umm-Al-Qura, and contributes to the preparation of professionals qualified to build the country.
>
> The Department directs its efforts and its interest to the study of the arts and sciences in order to contribute to the formation of the built environment, which enriches human life and prosperity. The objectives of the Department of Islamic architecture are:
>
> - Making a generation of architects and planners aware of Islamic teaching so that they can take on the responsibility of designing and planning cities and buildings in Islamic societies.
> - Raising the standards of the planning and architecture profession in Islamic countries by promoting the application of the principles, goals, and concepts of Islamic architecture.
> - Taking up and supporting research, writing, and translation work in relation to the Islamic heritage. (pp. 2-3)

The current aims and objectives of the schools of architecture in Saudi Arabia are, in some cases, no different from the aims and objectives stated in the school catalogues of ten or more years ago. This suggests that a conscious consideration of aims and objectives in guiding the philosophy of the schools does not play an important role in the thinking of those who manage and administer the architecture schools concerned.

It may be noted that amongst the stated aims and objectives of the schools of architecture is the preparation of the student for the world of architectural practice in Saudi Arabia. This raises the question whether the aims and objectives are indeed appropriate to the needs of the practice of architecture in Saudi Arabia, and the question whether the aims have been fulfilled.

Consideration should also be given to the question of the relationship between the aims and objectives of a school and its curriculum, in particular whether the curriculum is based upon the aims and objectives of a school, or whether the aims and objectives are more in the nature of a rationalisation of the existing curricular structure. The question of whether the curriculum, whether in design or content, is appropriate to fulfilling the aims and objectives of the school also suggests itself, particularly in view of the emphasis given in the aims and objectives to the integration of architectural skills and the educationally holistic ideals expressed.

Although the aims and objectives are stated in school catalogues, the means to achieve those ends are not stated. This is, to an extent, what ought to be expected, but it would give more credence and authority to the stated aims and objectives if an illustration of the means to reach them were given. An indication of how realistic and attainable the aims and objectives of a school are, and how success in achieving them might be measured, would also be welcome.

In this chapter we will give thought to the issue of the capacity of the teachers to fulfil the aims and objectives of the school and whether the school has the physical and financial resources to do so.

7.4 Admission Policies

As we have noted in Chapter 6, in Saudi Arabia the government provides free general and higher education, and financial bursaries for students. University students receive financial bursaries and free housing, along with meals, books and transportation at subsidised prices (Ministry of Planning, 1995).

This means that purely financial considerations seldom debar a student from following his chosen course at a Saudi university. There are, however, other constraints and parameters affecting study possibilities for architecture students, and these are discussed below.

Universities in Saudi Arabia within which schools of architecture operate have a number of specific regulations concerning the admission of students to the University. The admission policies for a new students are as follows. The applicant must:

- Be male. Schools of architecture in Saudi Arabia accept only male students (except for the College of Architecture at King Faisal University, which accepts only female students for its interior design programme).
- Possess a high school certificate (or its equivalent), which must be science-based rather than humanities-based.
- Be a Saudi citizen, except in exceptional cases. Non-Saudi students are offered scholarships in accordance with percentages and procedures specified by the University.
- Pass a physical examination.
- Have good character, attested to by letter from the secondary school attended.
- Register as full time student (Ministry of Higher Education, 1980).

We have indicated (Chapter 6) that some less academically inclined pupils in Saudi Arabia have their secondary education not in a high school but in a school which prepares them for a trade or craft. It should be noted that such pupils are not accepted into university, and therefore architecture school, though it is traditionally from such areas that architects have come in the past (for example master builders and stonemasons).

The fact that students are only accepted into an architecture school if they have followed a science-based path during their secondary education means that many potentially capable students are debarred from becoming architects, and it deprives architecture of some students with artistic talent. Although in schools there is some provision for drawing classes, these classes do not continue after intermediate school, and art and architecture do not feature at all in pre-university education in Saudi Arabia. Moreover, the stipulation that students must be registered as full-time means that a student cannot seek to broaden his experience by also working part-time in an office.

Several interviewees see falling standards amongst students entering the study of architecture, and some attribute what they see as the falling standards to universities' admission policies.

The teacher Mufti (interviewed 1998), for example, comments on the students entering his school: 'The quality of the students we are getting is getting poorer and poorer. We are getting students without ambitions, who just want to get good grades, pass their exams, and get their degrees.'

The architecture teacher Ustankok, a non-Saudi teaching architecture (interviewed 1998) describes some of the students who arrive as displaying

> total indifference to the profession, because they found themselves in the schools studying architecture and don't care for architecture all that much. Some of the students are not cut out for architecture to start with . . . You find nevertheless that students who are falling short in this still get to graduate one way or another, and bad buildings get built.

Another teacher, Saleh (interviewed 1998) feels that many of the students now coming into his school have no aptitude to be architects:

> Also we need to filter the students at the admission stage, because not all of the students we have here are cut out for architectural studies. To avoid this problem in the future, the admission procedure should include interviews and an aptitude test.

This comment highlights the admissions policy of schools and this is something of a recurring theme, the point being made by four of the teachers who comment on the poor quality of students. Ustankok (interviewed 1998) is critical of student quality, blaming the admission process to architecture schools. He states:

> I think that the shortcomings that the students carry with them as they graduate come from the selection criteria at the entrance level. If we are admitting students who are not talented enough or

inclined enough, scholastically apt enough, for the study of architecture, then at the end you will have someone who is not really trained as an architect. So the end result starts with the entrance level. We have observed that, when we lower the entrance requirement compared to the years before, we always have worse result, so I think there is a correlation although it is not scientifically proven. What is necessary is for more selective criteria to be applied. We do have a certain GPA average after the high school, and that forms the basis of our admission.

Mohammed-Ali (interviewed 1998), another architecture teacher, criticising the lack of a proper admission policy, points out:

> We have a problem in our admission policy. We do not have an aptitude test or interview with students before they are admitted. We admit them based only on their high school diploma grades, and this is not really a good criterion. Sometimes you can find a student with a 70 percent average whose architecture school performance is better than that of a student with a 90 percent average, because of his superior interest and motivation.

The admission policies of universities, which do not allow for screening for aptitude for or for genuine interest in architecture, are seen as in part to blame for what is regarded by many as the poor quality of student entering the architecture schools.

7.5 Students

The number of students amongst schools of architecture in Saudi Arabia varies between schools, with KSU having the largest number, 304 in the academic year 1997-98. In the same period KAAU had 224 students, UQU 185, KFU 166, and KFUPM 43 (See Fig. 7.6).

Apart from KSU and KFUPM the other three architecture schools have a similar number of students. KSU has the biggest architecture student population in the Kingdom for a variety of reasons. It is the biggest (most populous) university in the country and it is located in the capital, Riyadh, which attracts students from all parts of the Kingdom. Further, Riyadh is situated in one of the most populous parts of Saudi Arabia.

As for KFUPM, from its inception it has suffered from low enrolment numbers. According to Jan (1983), this is due to the fact that it has adopted a completely American system, quite foreign to Saudi Arabia, with English as the medium of instruction. Furthermore, the teaching staff have always been largely international. KFUPM is also located in the eastern part of the country, the least populated, so that opting to study at this university demands from many students a full commitment to leaving their family and home area for long periods; not all students are prepared to do this. However, KFUPM has what many view as an advantage in being a fully residential university.

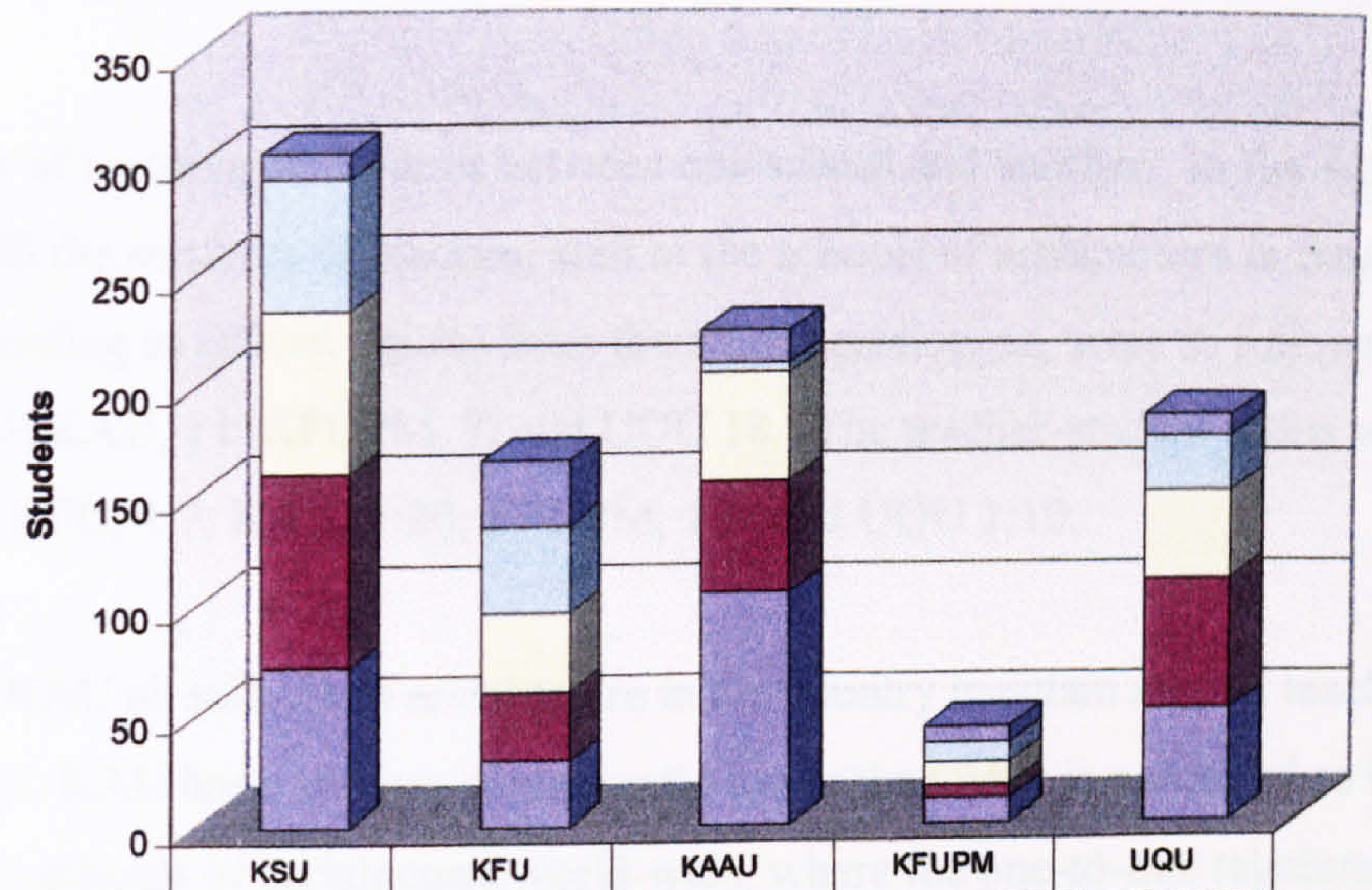
As can be seen from Fig. 7.6 the numbers of students in the schools are not evenly distributed through the academic years, with a growing number of students taking up architecture studies with each year. The reason for the greater intake is that with the increasing number of students graduating from Saudi Arabia's secondary schools, the post-secondary educational institutions are facing a growing social demand for education (Ministry of Planning, 1995). This is an issue which has been touched upon by some interviewees, in particular several architecture teachers. They make the point that the teaching staff and the facilities cannot keep up with the changes. This situation may perhaps deteriorate even further, because, according to the Ministry of Planning's last Five-Year Development Plan, there will be an even greater number of secondary school leavers in the future who will be qualified to undertake university education. And, since schools of architecture have no control on the number of students they receive annually, they will have to do their best to cope with whatever numbers are imposed upon them by the admissions offices of the universities.

The teacher Haikal (interviewed 1998) comments in this regard: 'The admission office of the University sends us every year an increasing number of students without proper understanding of what architecture is all about.'

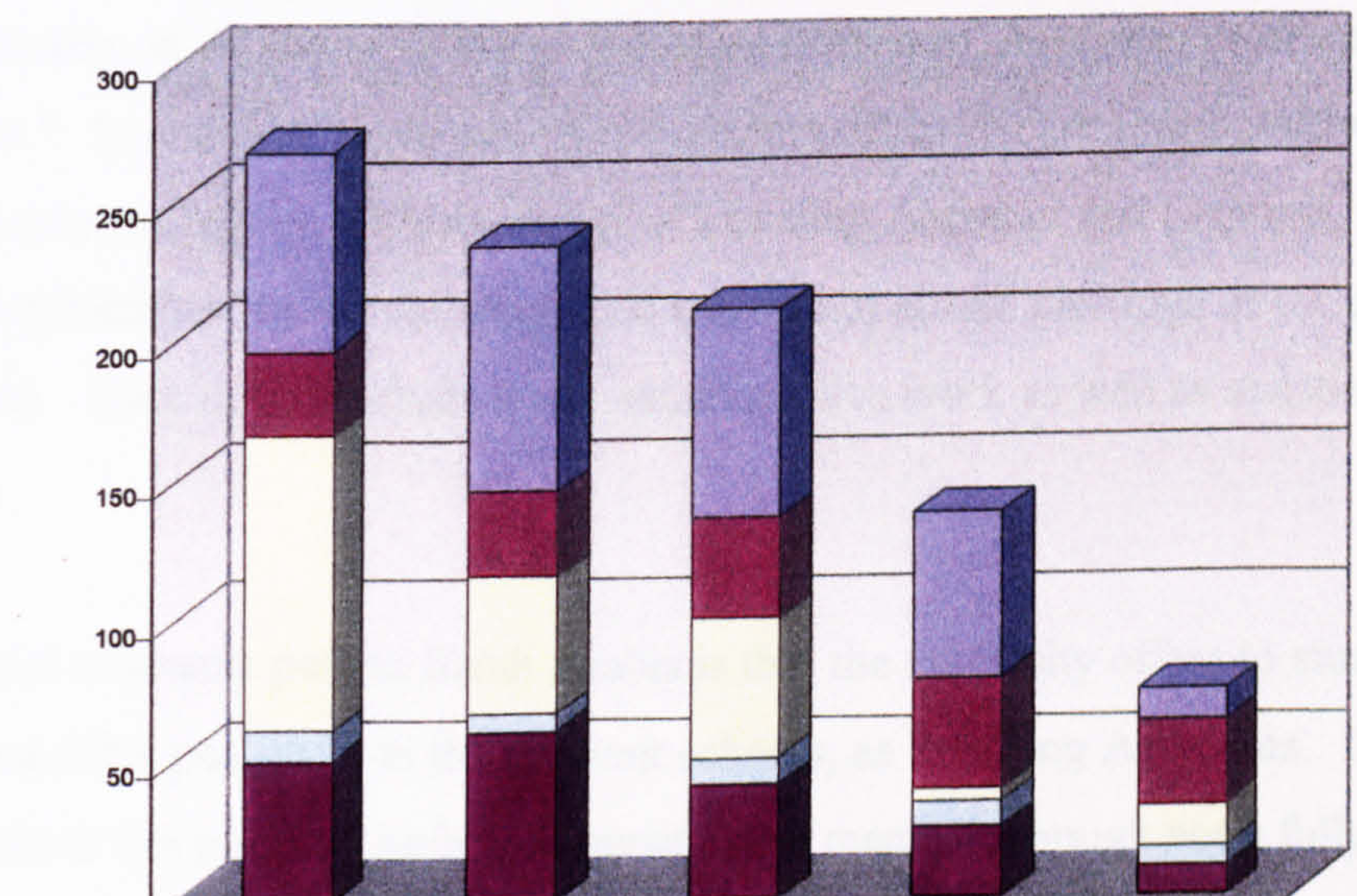
Ustankok (interviewed 1998), like several others as we are discovering, believes that a more adequate screening of candidates for architecture would help, although he does not think it is viable under the current education system in Saudi Arabia where the admission to schools of architecture lies within the control of the Deanships of Admission and Registration of the host universities:

> There is a quota imposed on the schools, a requirement to take a certain number of students, which is a reality of life with the population increase in Saudi Arabia. But this usually works against the expected quality. We are not equipped to treat equally any number of students. Therefore architectural education is not able to respond to everyday demands that keep increasing. I don't think this is necessarily a shortcoming of architectural education. It is just that architectural education has a different nature from what is expected of it in this area. This is maybe mostly peculiar to Saudi Arabia, because of the phenomenal population increase we are experiencing at the moment. This is going to make things worse and not better. We cannot do additional screening, set additional aptitude tests. We have to take whatever comes out of the high schools, and that upsets the whole system of quality control.

The implications of generally increasing students numbers for the profession are drawn out by the teacher Siddiqi (interviewed 1998): 'If you keep educating architects you will flood the market. Because it is a young society the job opportunities are not going to be there for a long time.'



	KSU	KFU	KAAU	KFUPM	UQU
5th Year	11	30	15	7	10
4th Year	59	40	4	9	25
3rd Year	74	36	50	10	40
2nd Year	88	30	50	6	60
1st Year	72	30	105	11	50



	1st Year	2nd Year	3rd Year	4th Year	5th Year
KSU	72	88	74	59	11
KFU	30	30	36	40	30
KAAU	105	50	50	4	15
KFUPM	11	6	10	9	7
UQU	50	60	40	25	10

Fig. 7.1: The distribution of students in schools of architecture in Saudi Arabia in 1997-98.

7.6 Teaching Staff

The number of teaching staff varies between one school and another. In the Academic year 1997-98 the numbers of teaching staff at the schools of architecture in Saudi Arabia, according to official figures from the school catalogues, were as follows: KSU, 31; KFU, 23; KAU, 11; KFUPM, 7; and UQU 18. The teacher-student ratios were: KSU, 1:10; KFU, 1:7; KAU, 1:20; KFUPM, 1:6; and UQU 1:10.

Apart from KAU all schools of architecture in the country maintain a good teacher to student ratio. KAU has a teacher-student ratio lower than what is perceived to be acceptable in schools of architecture world-wide, where the one-to-one relationship between the instructor and the students is the vehicle through which instruction in the design studio is carried out.

All the Saudi schools of architecture, as constituent parts of universities, display the same university teaching staff pattern as far as hierarchy and rank are concerned. The staff hierarchy, in ascending order, is Assistant Professor, Associate Professor, and Full Professor.[35] In addition, there are other members of the departmental staff who have teaching responsibilities, with the ranks of Teaching Assistant and Lecturer, who are not considered members of the teaching staff and do not attend meetings of the department committee. Their duties include some administrative work as well as assisting with teaching.

The normal academic path in Saudi Arabia is that the university offers to students with the highest GPA positions, in the relevant schools, as Teaching Assistants. If a student accepts, from this point on he is a university staff member (though not a fully-fledged university teacher) and can only lose his staff position by royal decree, like all other holders of government appointments. After one year as a Teaching Assistant, the individual is generally offered a scholarship to pursue his postgraduate education abroad, normally in the UK or the USA. Following upon the achievement of his

[35] The term 'teacher' as used in this study refers only to these three categories.

master's degree, he is promoted to Lecturer. Later, after successfully completing his Ph.D. studies, which is a necessary requirement, a Lecturer becomes an Assistant Professor. Promotion to Associate and finally Full Professor depends upon the teacher spending four years as an Assistant Professor, during which time he must be able to show a minimum of four publications, and four years further years as an Associate Professor, with a minimum of six publications during this time. It should be noted that these are not simply average or recommended periods and publication rates, but are in fact laid down by regulations produced by the Higher Education and Universities Council (Okaz, 1997).

Because all teaching of architecture students, with the exception of structure and some particular university requirements such as English language, physics, and Islamic Studies, is carried out by architecture teachers, this means that there is a degree of specialisation amongst the teaching staff, even though all are of the same architectural background. The specialist expertise of architecture teachers is in fact on the increase, since schools endeavour to ensure that those Teaching Assistants and Lecturers whom they send abroad to gain postgraduate qualifications work in a variety of areas within the broad field of architecture. This means that schools are increasingly able to entrust teaching in a variety of subject areas within the architecture curriculum to staff whose initial training has been in architecture, but who have now further specialist knowledge, rather than bring in teachers from other university departments, who might not be so able to relate what they teach to the requirements of future architects.

It is clear from this career path of teachers sketched out above that promotion for an architecture teacher does not depend on any practical work or display of expertise in the field of architectural practice, but simply upon length of service and research performance. At no point, from his selection to be offered a Teaching Assistant post on to the attainment of a full professorship, does an individual have to practise architecture. There is also no mechanism through which part-time teachers who are architecture practitioners can be hired to assist in teaching architecture in the Kingdom's architecture schools. There is also no provision to permit teachers in architecture schools to practise architecture, an instance of the general regulation debarring government employees - which university teachers are - from holding any other post.

The interviewees in all three groups have a great deal to say about teachers and teaching in the architecture schools of Saudi Arabia. The facts that architecture teachers are not permitted to practise and that practitioners are not permitted to teach are two of the features of the architectural education condition in Saudi Arabia that cause comment amongst interviewees with great frequency. In the remarks of many respondents a direct association is made between this situation and the perceived gap between architectural education and practice.

The architecture teacher Fadan (interviewed 1998) explains the gap between education and practice by reference to the fact that teachers do not practise:

> The cause of the problem is that there is a gulf between teachers and practitioners. On the one hand architecture teachers in Saudi Arabia do not practise architecture. Practitioners, on the other hand, are not invited to teach at the university.

He draws out the implications of this situation for teaching:

> Teachers of architecture are not practising architects. They do not, therefore, have any practical experience of an architect's work to transmit to the students. The teacher should be allowed to practise in order to gain the required knowledge of the day-to-day work of an architect, in order to transmit it to students.

Barhamain (interviewed 1998), an architecture teacher, also highlights the gulf between teachers and architectural practice: 'Most of the teachers do not practise architecture, and this is the general weakness of most of the Departments of Architecture in Saudi Arabia.' The teacher Lyali (interviewed 1998) states: 'The teachers are too academic. They lack knowledge of the practicalities of architecture because they are not allowed to practise.' Likewise the teacher Ghamadi (interviewed 1998) states: 'One problem of architectural education in Saudi Arabia is that the teachers of architecture do not practise architecture, and practitioners do not teach.' Another teacher Sa'ati (interviewed 1998) remarks:

> The Saudi teacher unfortunately does not practise architecture. Without this he will not understand the complexity of architectural practice, such as the relationship of the architect to the client, to the contractor, and so on.

The teacher Saleh (interviewed 1998) points out the impossibility of learning, even by imitating, from teachers who are not practitioners: 'Teachers in schools of architecture in Saudi Arabia do not practise architecture, so that the student cannot learn from the teacher's behaviour.'

Siddiqi (interviewed 1998), a non-Saudi teaching in Saudi Arabia, compares the Saudi situation unfavourably with that elsewhere:

> In many countries elsewhere in the world teachers in architectural education are allowed to practise. So they bring back into the studio and into the class a professional experience of practice, of architecture. Unfortunately it is not allowed in the Kingdom of Saudi Arabia. So the Saudi faculty are not allowed to practise and thus they have their inherent difficulties.

The teacher Hilton (interviewed 1998) is in no doubt of the value of having school staff who are involved in practice. He explains:

> When I was working in Kent five years ago I was a course director. There were very few full-time staff. The main studio staff were young practitioners who worked in pairs and these were bringing knowledge from the cutting edge of design and technology to the studio, and that does make a terrific difference.

Another non-Saudi teacher in a Saudi architecture school, Ishteeaque (interviewed 1998), speaking about reasons for the gap between education and practice, says:

> Yes. I think there is a big gap. One of the reasons is that most teachers in the School of Architecture in KFU have had a very limited work experience. This is not a criticism but a factual observation. All the teachers have received a top education; they have the ultimate degree in architecture. But if not all of them, then indeed I would say most of them, have never worked in a real life situation. So what is happening out in the field is one aspect from which they are isolated. Once they come here and teach they will not be able to respond and relate to problems addressed in the real world

The teacher Haikal (interviewed 1998) points to what he sees as some tension between architecture teachers and practitioners when he speaks of the problem. He compares the Saudi situation unfavourably with that in Egypt:

> Between practitioners and teachers there is always a degree of discord. One group possesses the knowledge, the other carries out

> the practice, and there is no integration between the two. This gap has been widened because in Saudi Arabia teachers do not practise and practitioners do not teach. In Arab society university teachers still have more status than architects. Architectural practitioners are regarded as tradesmen rather than professionals, and are not accorded the same prestige as teachers, which increases the discord between them. In Egypt teachers of architecture also practise architecture, so that the gulf between the two groups is smaller.

Hariri (interviewed 1998) expresses the frustration felt by teachers when he recalls an attempt to get the situation changed:

> Teachers don't practise. The only professionals who teach at the university who are allowed to practise are medical doctors. Even officials are not convinced of the importance of teachers actually being involved in architectural practice. We were at one time in a meeting with the Minister of Higher Education, and we demanded that teachers be allowed to practise while teaching, and the Minister argued that 'you are practising through teaching'.

The awareness of the difficulties caused by teachers not being practising architects is also strong amongst architecture practitioners. Kamfer (interviewed 1998) says:

> One of the reasons that led to this gap is that the doctors do not practise architecture as a profession. And that the curriculum was devised by academic teachers without consulting those who practise architecture.

And the practitioner Rifai (interviewed 1998) states: 'And I think the reason for this gap is that most of the teaching staff do not practise architecture.' The practitioner Shoabi (interviewed 1998) points out a practical economic consequence of the separation of teachers from practice. Speaking of designing to budget he remarks: 'How to determine cost depends on the experience of the architect in cost analysis, and the teachers cannot teach this because they don't practise.' Another practitioner, Aba-Al-Khail (interviewed 1998), is in no doubt that there is a gap between architectural education and practice, and where the reason lies: 'Yes, there is of course a gap. And that is because practitioners and teachers are two different creatures in this country.' That practitioners cannot teach is evidently something he feels personally strong about:

> I have set up a practice and have twenty-five years' experience. I would like to do some teaching, even as a part-timer, to pass on some of my knowledge and experience. But the system will not let

> me do this, because practitioners are not allowed to teach, even part-time.

The practitioner Fayez (interviewed 1998) is of the opinion that it is in the practical non-technical side of architecture that teachers most reveal the deficiencies related to their not practising:

> The students lack due understanding of human behaviour and its influence on design, the understanding of the client's needs. Also they lack understanding of building economics. These things unfortunately are not addressed in the school. Because the teachers themselves are not involved in practice, they are not exposed to these practice concerns. Either implicitly or explicitly, the student is taught that the design of a good form and a nice elevation is what architecture is all about.

The practitioner Nwaeser (interviewed 1998) recalls the advantage it was to be taught by someone with knowledge of practice:

> I remember that when I was a student I studied in the design studio with a professor who used to be the Director of the Administration of Building Construction in the Ministry of Interior. And we were really happy and comfortable working under his supervision because his practical experience was reflected in his teaching.

Students too are conscious of the problems caused through teachers not being permitted to practice. Gadair (interviewed 1998) states: 'The Saudi teacher has minimal experience of the world of practice.' Madkhali (interviewed 1998) says: 'The teachers are prohibited from working in an office so that they can't give us what is new in practice.' This is echoed by Hilmi (interviewed 1998): 'Most of our teachers don't practice architecture, and are therefore not familiar with the requirements of day-to-day practice.' The student Ghanim (interviewed 1998) says: 'The quality of the teacher, by whether he practises architecture or not, determines the quality of the course.' Ghanim is also struck by the strangeness of professional practice subjects being taught by a teacher who is not a practitioner:

> The success of teaching these subjects depends on the teacher. If the teacher is in touch with practice then the teaching is practical and pragmatic. And the content of the subject is taken from the real world of practice. However, if the teacher does not practise then you will find the teaching too academic, abstract, and theoretical in nature. You will find the content of the subject has no link with practice.

The student Zinaigeer (interviewed 1998) complains about the lack of practical experience amongst teachers in his architecture school: 'The teachers who taught us professional practice don't practise. We want teachers who teach us the know-how of practice. We want teachers with experience.' Asked about the causes of the gap between training and practice the student Najar (interviewed 1998) replies: 'I think it has to do with there being no link between the teacher and the world of practice.' Najar's fellow-student Nawawi (interviewed 1998) agrees:

> Yes, there must be a link between the teacher and the world of practice. The benefit is that we can widen our horizon from our interaction with a teacher who is practising the profession, who has practical experience about what is happening in the real world.

It is clear from the volume and unanimity of the responses of the interviewees in general that the isolation of Saudi teachers from architectural practice because they cannot practise is felt to be a big disadvantage. This shows itself in their inability to teach students about the everyday realities of architectural practice and in their inability to act as models or examples for the students.

Not only are teachers not permitted to practise, but practitioners cannot do any teaching, and their only contact with students is as jury members. Again there is a general feeling amongst the respondents that valuable experience is here going to waste.

There can be no doubt from the observations of interview respondents that the isolation of teachers from practice and of practitioners from teaching are major causes of the gap between architectural education and practice in Saudi Arabia. The influence of this situation on the curriculum and its delivery will be explored in Chapter 8.

The teaching establishments at Saudi schools of architecture include non-Saudi as well as Saudi teaching staff. When the first architecture schools in the country were set up there were no Saudi teachers at all, and then mixed teaching staffs, but with non-Saudis dominating. However, with the passage of time, as more and more Saudis graduated from the architecture schools in the Kingdom, it became possible for the teaching establishment to be staffed by a greater and greater proportion of Saudis. The Saudisation policy was a further factor in the increasing proportion of Saudi architecture teachers. Today, the overwhelming majority of architecture teachers in the country's schools are Saudis. Table 7.1 illustrates this change showing the relative proportions of Saudi and non-Saudi teachers in 1988 and 1998.

Teacher	Saudi	Non-Saudi	Saudi	Non-Saudi
University	**1988**		**1998**	
King Saud University	8	9	28	3
King Faisal University	7	11	13	10
King Abdul-Aziz University	9	6	11	0
King Fahad University	1	8	4	3
Umm Al-Qura University	3	10	12	6

Table 7.1: Relative proportions of Saudi and non-Saudi teachers in 1988 and 1998.

Although many of the non-Saudi teachers, unlike their Saudi colleagues, have had experience of architectural practice, they suffer a drawback in another way. As is pointed out by the teacher Hariri (interviewed 1998) they have the disadvantage that they are not in tune with the local culture:

> Sometimes the teacher is a non-Saudi and has a limited perspective of the cultural context within which Saudi architects have to operate, so that he cannot transmit it properly to the students.

Siddiqi (interviewed 1998), himself a non-Saudi architecture teacher, also comments on this handicap of non-Saudi teachers:

> Where the Saudi faculty does not have the practical experience, at the same time the non-Saudi does have this background in practice, but they don't have the requisite background in culture and social issues. So they cannot understand the peculiarities of society as such. The result is that they end up teaching a lot to the student but the student is not able to deliver that in the field, because his knowledge and ability to comprehend things is out of the frame of practice in Saudi Arabia.

Kamfer, a practitioner (interviewed 1998), states of his student period that some non-Saudi teachers were also not familiar with the Saudi market: 'Teachers were often from overseas and were not exposed to the Saudi market.'

Siddiqi (interviewed 1998) clearly believes that the solution is to allow Saudi teachers, who *are* in tune with the national cultural background, to have some experience of practice:

> It is true that the teacher's ability and his personal background and personal experience in his field are definitely a valuable asset to him. If teachers are allowed to practise or at least get involved in professional activities it will undoubtedly be a great benefit to the student and to architectural education.

Although non-Saudi teachers have generally had the advantage of spending a time as practising architects, this advantage is diminished by the fact that in the main they lack familiarity with Saudi culture and cannot always instruct in ways that are appropriate for the Saudi context.

7.7 Physical Academic Resources

The information about the presence or absence of the various elements that go to make up a school's academic support resources is based on the observations made by the researcher on his visits to the various campuses during his field trip in 1998. It is not always possible, however, to determine purely from observation whether facilities that are physically present have restricted availability or whether they are considered by their users to be adequate. Light on such questions can be thrown by an analysis of the interviews made by the researcher.

These physical academic resources and the physical environment in which the students have to study and the teachers have to instruct is a factor frequently mentioned by interviewees in relation to Saudi schools of architecture. By this is meant the not only the extent, quality, and accessibility of facilities such as libraries, computers, labs, and so on, as mentioned above, but also the physical condition or aesthetic qualities of the school itself. Several respondents comment on these things, and inadequacies in them are often linked to shortage of manpower and, ultimately, management of finance. Lack of proper facilities is seen as one further factor inhibiting the educational potential of Saudi architecture schools, and thus contributing to the gap between training and practice in the country. Not surprisingly comments on this area come more from teachers and students than from practitioners. There are greater variations between the various architecture schools as far as general environment and facilities and their use are concerned than there are in matters of teaching quality, student attitudes, and so on, to judge from the responses of interviewees. We shall therefore, in this section, indicate the school to which a teacher or student belongs in the responses quoted.

Because universities are relatively recent phenomena in Saudi Arabia, the government has invested in the building of new campuses for all the universities and the buildings in which the schools of architecture are housed are therefore new and of a good standard. All the schools of architecture are in an agreeable environment in permanent buildings except for the School of Architecture in King Faisal University, which is located in a temporary building. A new building for the school of architecture, however, is under construction. A KFU student, Zinaigeer (interviewed 1998) comments on his school's environment: 'The building we are in at the moment is a temporary building. There is no privacy in it or lockers to leave our private things. There is no permanent exhibition.'

In UQU, where a recent move has been made from an old to a new complex, users are able to contrast the new with the old and to note what a difference the new environment makes. The UQU teacher Hariri (interviewed 1998) is in no doubt about this:

> The physical environment is very important in the training of architects. The building where architecture used to be taught in our school was old and in a bad state of repair. It was in any case poorly designed. This meant that the students had no examples or archetypes to observe to see what a well designed and constructed building looked like, how the various systems it incorporated integrated with one another. Now the School has moved to a new multi-million dollar complex, where the students can see from their surroundings live examples of good design and construction, and how the various disciplines in architectural training contribute to an integrated and efficient structure.

Another UQU teacher, Saleh (interviewed 1998), expresses similar sentiments:

> The environment also plays an important role in the education of the architect. The Aziziah campus was not a healthy environment. However, now in the Abidiah campus students can learn from the buildings.

A KFUPM teacher Siddiqi (interviewed 1998), sees a great advantage in his university over other universities in one particular aspect of its physical environment – it is a residential university:

> KFUPM is a full residential university; all the students live on the campus. By contractual obligation the faculty has to live on campus. In KFUPM there is so much proximity between teachers and students day and night, including the use of laboratories. This has created a kind of innovative and creative environment in the School of Architecture.

Siddiqi expands on the advantages of this situation:

> This is one of the major reasons that this University can boast of higher achievement, because they provide both the students and the teachers an environment in which they can actually work as a team.

In addition to the general environment of the schools they are equipped with facilities which support the process of education, though the standard and extent of the facilities vary from one school to another. Judging from site visit made by the researcher to schools of architecture in 1998 the following are typically to be found in schools of architecture: studio spaces, computer laboratories, professional reference libraries, model making workshops, building science laboratories, photographic laboratories, and reproduction centres.

All schools of architecture have studio spaces provided with drafting tables. However, the quality and capacity of the design studio varies from one school to another. While almost all schools of architecture in Saudi Arabia have sufficient design studio spaces to accommodate all the students, the School of Architecture in KSU, because of the high enrolment numbers, has insufficient such spaces. The school's interior courtyards are therefore being used while the extension of the school is being completed. Gedair, a KSU student (interviewed 1998), expresses frustration that students feel:

> We would like to stay longer studying in the School, but the environment of the School does not encourage us. There are no lockers, for example, where we can leave our belongings and drawings safely.

In terms of quality of facility all the schools provide their students with drafting tables. However, in KFUPM the studio spaces are more generous. Each student is provided with a separate cubicle with a drafting table and study desk, lamps, drawers, shelves, and lockers.

Computer laboratories help the students develop their skills in designing and drafting with the use of computers. After recognising the importance computers play in today's professional life schools of architecture started to introduce computer aided design and drafting as part of their curricula. All the schools of architecture in Saudi Arabia now have computer laboratories but the quality and capacity varies from one school to another. For example the School of Architecture in KAU has the least capacity with ten computers only, while there are 50 computers available in KSU. Because of the limited numbers of computers the priority in computer availability in all the schools of architecture is restricted during class hours to the students who are taking the computer course. Gazawi, a student at KAU (interviewed 1998), regards the computer labs as out-of-date and inadequately equipped:

> With regard to computer labs, they are unequipped. If a student wants learn about Autocad he must do so outside the School. There are some students who will graduate without any knowledge about computers, and as you can see from practice every office uses Autocad now; nothing is drawn manually.

And Mohammed-Ali, a teacher in KAU, (interviewed 1998) is unhappy with the computer lab facilities in his school:

> We have no computer lab or technicians, because of the routine and the limited financial resources. If the School wants to keep up with the market, we should have a full computer lab with full technical support.

Lyali, a teacher at KFU (interviewed 1998), complains that there are no proper computer facilities in his school: 'It is now expected that architecture students will have experience of CAD, but we do not have a computer lab to teach them.'

There is a lack of comments from interviewees from KSU and UQU on computer lab facilities, since these schools have such labs and they are well used.

All schools of architecture in Saudi Arabia have access to architecture libraries which contain books, periodicals, maps, video collections, slides, etc. In some cases these libraries are specialist architecture or architecture-related libraries located within the school buildings, and in some cases they are architecture or architecture-related sections within the main library of the university concerned. KAU and KSU, for example, have their own resource centres but have to use the main university library facilities for books etc. In the case of some libraries there are no borrowing facilities, so that the resources available, no matter how adequate in other ways, are for reference only.

A teacher in KAU, Mufti (interviewed 1998), is unhappy with his school's library: 'The library has not received even one new book or periodical in the last ten years. It is difficult to teach without texts, and the students are not kept up-to-date.' Mohammed-Ali, another teacher in KAU, (interviewed 1998) is also unimpressed with the library facilities: 'The library is terrible. There are no books, and no money to get books. Without text books we cannot teach.' The student Hilmi (interviewed 1998) tells a similar story about KAU. He states: 'The library books are all old.'

The student Kazim (KFU) (interviewed 1998) says of his school's library: 'The library lacks new books and we have no architectural periodicals.' A teacher at KFU, Sa'ati (interviewed 1998), agrees that the library facilities are not adequate:

> The problem with the library is the resources. The new arrivals in terms of textbooks and journals are very weak. It is also inadequate in terms of electronic information systems.

On the other hand another teacher at KFU, Hilton (interviewed 1998), denies that there is any shortage in his particular environment. When it is put to him by the researcher that some students say there are insufficient library and lab facilities he replies:

> It isn't true. The students don't use the facilities very well. Some of the books are very old. But there are some up-to-date journals in the library but the students are reluctant to use them.

When asked why this is, he makes the same point as some other respondents have made about the language of instruction and text books: 'Maybe because of the language barrier and because the students don't make the effort.'

Fadan (interviewed 1998), a teacher at KSU, asked by the researcher about the physical academic environment at his school, makes a typical response about the library:

> This is very important for the education of architects. Unfortunately this environment has some shortcomings in my school. The library stock, for example, is inadequate. The journals are all out of date because we no longer subscribe to the ones we used to, and there is no new stock of books arriving. The last new book we took is now five years old. The only way that even the teaching staff can keep themselves up to date is to buy new books themselves. The students, therefore, do not have access to an up-to-date library, and they are always behind.

As far as the KFUPM library is concerned the student Madkhali (interviewed 1998), feels the library is poor: 'The library is old, and regular periodicals are few.'

As regards the other academic support facilities that we have noted - model-making workshops, building science labs, photography labs, structure labs, building materials labs, and reproduction centres - the researcher in his visits noted that they are all available in each architecture school, except for a reproduction centre (photocopying etc.) which exists only at KFUPM.

The use made of the facilities, however, varies greatly between schools. The researcher's observation indicated that at both KFUPM and KSU the facilities were excellent. However, at KFUPM it was noted that lectures and other instruction took place in the labs, whereas at KSU they were not observed in use. At UQU they were still under construction during the researcher's visit so that it was impossible for him to assess their quality, accessibility, or use from observation. The Chairman of the Department informed him, however, that there was considerable financial outlay involved in the provision of the new facilities. At KAU they were simply not available for use through temporary closure due to financial constraints, as we shall see from the analysis of the interviews. At KFU, though facilities are available, the researcher was denied access by the School Dean for administrative reasons.

Many of the comments about the under-use of labs come from teachers and students at KSU, and this may be because at that school the lab facilities are up-to-date and therefore the teachers and students know what it is to have good facilities lying unused.

The KSU teacher Fadan (interviewed 1998) accepts that the facilities exist but they are not used properly:

> As for the labs, they are not fully utilised because, as far as I know, the teachers do not encourage their students to use them, and by that I mean that the labs are not incorporated in the teaching methods of the subjects.

Amongst students Ghanim (KSU) (interviewed 1998) believes that his school is well equipped but that not enough use of facilities is made: 'We have all the labs any school would dream of. But in five years we have visited these labs only once or twice.' His fellow-student Assaf (interviewed 1998) confirms that the labs are under-used: 'Although we have a fully equipped structural lab the teachers never took us to it.' This is backed up by Jamaz, also KSU (interviewed 1998), who hints at lack of interest on the part of teachers:

> Also our visits to labs are not credited to us towards our final grade of the subject, so there is no encouragement for us to go to the lab and use the equipment.

At KFU architecture school, too, there is an indication that the teaching staff do not make use of academic support facilities in their teaching. The student Atiah (interviewed 1998) explains: 'In the first year the teachers took us on a tour of the different workshops, and that was it. We have never used them.'

As for the lab and workshop facilities at UQU, the student Hashimi (interviewed 1998) says: 'We did not use these facilities at all. The courses were all theoretical.'

At KAU the lab facilities themselves are not criticised, but the lack of support staff inhibits their proper use. Mohammed-Ali, a teacher in KAU, (interviewed 1998) explains:

> The availability of labs in the School is one thing, however; utilising them is another. We have had an excellent materials lab ever since the School was founded, but it has never been used in the teaching process because there is no technician to operate it. No teacher is willing to take the responsibility because if the possibility of accidents.

Another teacher in the same school, Mufti (interviewed 1998), endorses this:

> Also we do not have the technicians to operate the labs. For example we have a workshop that cost the University SR 1 million, but we cannot operate it because there is no technician. The photography lab also has never been used because there is no technician, and the materials have all passed their expiry date.

It should not be overlooked that some teachers believe that the lab facilities in their particular school are perfectly adequate. Rageeb , a teacher at KFUPM (interviewed 1998), comments:

> The physical academic environment in King Fahad University is excellent. Everything is available and accessible and all the labs are equipped with the necessary materials and technicians. We have a structural analysis lab, a building science lab, a model workshop, etc., and labs are always incorporated into the teaching of the subjects, which has a very positive effect on the student.

Siddiqi (interviewed 1998), another teacher at the same school, basically agrees that the facilities are good, though he perceives some under-use which he associates with the small number of students:

> The network of laboratories is well developed. We have good labs on acoustics, environmental control systems, structural analysis, and lighting, and model making workshops. Unfortunately, because of the reducing number of students in the intake, the efficiency of these labs has dropped. There are fewer and fewer students available and their orientation to these labs is less practised. There are only four students in a class.

As with the teachers, the KFUPM lab facilities escape the general criticism from students. The KFUPM student Niazi (interviewed 1998) states: 'The workshops and labs are okay. There are excellent workshops and in fact some teachers use them to hold classes in.'

If labs are available but are not fully utilised it means that subjects are taught theoretically, on the blackboard, instead of in a practical environment, something which has been noted in the responses of interviewees about curriculum and teaching matters.

The general picture, then, that emerges about the physical academic environment in Saudi architecture schools is one of poorly equipped libraries and lab facilities which are either lacking or, for one reason or another, under-used. This is generally thought to be because teachers do not know how to use the labs/workshops or have no inclination to do so – that is, it is seen as a teaching method deficiency – or because there are no qualified personnel in the form of technicians to look after them. However, we should note that, in the remarks of teachers and students alike, KFUPM seems to be an exception to the general situation. While there is some criticism of the library at KFUPM, there is generally high praise for the lab and workshop facilities, and it is noted that good use is actually make of these facilities by some teachers. KFUPM is furthermore a residential university, so that teachers and facilities alike are more readily accessible than in other schools, and this is regarded as a great bonus. The beneficial general environment of a pleasant school campus, as distinct from specifics like the library or lab facilities, is also noted by teachers at UQU, where the new campus is seen as much better in this respect than the old.

There are some elements of disagreement amongst respondents about the learning and other facilities available. For example, Mohammed-Ali, a teacher at KAU, claims there are no computer labs at his school, but the student Gazawi says there are, though they are unequipped and never used. And Hilton, teacher at KFU, wishes to distance himself from sweeping criticism of his school's facilities, feeling that the main problem is that students do not use them.

Libraries have generally few if any new publications, whether books or journals, and this is one reason why they are little used. In previous times the architecture school at KSU did not even have its own library. However, libraries are also under-used for one further main reason: the prevalence of books and journals in the English language. The need is felt for more material in Arabic.

The lack of good support facilities in the architecture schools of Saudi Arabia is one further reason why architectural education does not measure up and contributes to the gap between education and practice.

7.8 Course Duration and Structure

The undergraduate architecture course for all five schools of architecture in Saudi Arabia is a five-year programme leading to a bachelor's degree in architecture. All the courses follow a common pattern in general terms. The course is divided into three phases. The first year is a foundation year directed towards establishing a broad-based education for those entering the university and covers subjects such as mathematics, physics, English language. At KFUPM all university students do the foundation course together, and they can then at the end of the year choose their specialisation university-wide. At KSU, KFU, and KAU architecture students take their foundation course along with students within the same college, who are able at the end of the year to choose their study field from within those offered by that college, for example, architecture, landscape architecture, or urban planning. At UQU architecture students take their foundation course along with other architecture students only, a feature of the particular UQU system which forces them to select their intended study path at the start of their university careers.

In the intermediate phase, the duration of which is three years, is geared towards architectural study, the focus of which is the design studio. Students are required to enrol in design studios each semester. The curricula in architecture offer a core of six sequential studio courses on architectural design which are organised in a sequence whose complexity increases from one semester to another. These courses are run parallel to certain subject groups which include: theory and history of architecture, structure and building systems, construction materials, mechanical and environmental support systems, acoustics and illumination, and computer graphics.

The final year in the Saudi architecture schools is largely devoted to the preparation by students of their graduation design projects.

The academic year is divided into two semesters with each semester being fourteen weeks long. The curriculum is therefore divided into ten semesters. Each semester is divided into units, each of which is equivalent to 50 minutes of lecture time or 100-150 minutes of lab work. Up to the year 1992 students were able to exercise a certain degree of selection in their choice of subjects, based on credit units. In that year a Royal Decree, based on the recommendation of the Ministry of Higher Education, laid down that the Saudi universities should adopt the academic year system, in which the students were provided with a fixed timetable without a degree of subject choice. In this system the students are bound by the timetable, i.e. the students are not allowed to change the outline of the timetable by eliminating, adding, or dropping a subject. If a student fails more than two subjects then he will remain at that level to complete the subjects he failed. If the student fails one or two subjects he will advance to the next level. Meanwhile he will have to re-take the exams in the subjects he failed, though attendance is not required. If the student cannot pass the exam for the second time then he will be dropped from the school. The reason for this procedure is the relatively long time the student takes to complete his degree, as pointed out in the fifth and sixth Five-Year Development Plans. The new system adopting the academic year, has the potential to develop all the subjects taken in one year into an integrated academic unit, but this potential has never been explored (See Chapter 8).

The number of credit hours varies between one architecture school and another[36] (See Table 7.2.) The school within the highest number of credit hours in the academic year 1997-98 is KFUPM, with 183 hours, the next highest is KSU with 175, the next is UQU with 167, and the smallest number of hours is at KFU and KAU, each with 165. There is therefore an average of 171 credit hours per school, which, since the length of the curriculum in Saudi schools of architecture is five years, means an average of 17.1 credit hours per semester.

University	KSU	KFU	KAU	KFUPM	UQU	Avg.
Credit Hours	175	165	165	183	167	171
Semesters	10	10	10	10	10	10
Ave./semester.	17.5	16.5	16.5	18.5	16.7	17.1
No. of Years	5	5	5	5	5	5

Table 7.2: Credit hours in Saudi architecture schools.

[36] The data in this section is taken from the catalogues of the respective Saudi architecture schools.

As part of their general university and college requirements architecture students have to take a number of courses not immediately related to the study of architecture, courses such as Physical Education, Arabic and English Language, Maths, Physics, Islamic Studies, etc. The requirements of each university are different in credit hour terms for these courses. If the number of credit hours spent on these courses is subtracted from the total number of credit hours required at each university a different pattern will emerge. Table 7.3 indicates the total number of credit hours per architecture school and the number of credit hours each school sets aside for non-architecture subjects. It also illustrates the time in semester equivalents that have to be spent on such subjects in each school. The total number of credit hours that each school has left for architecture and architecture-related courses is also given, with the time in year equivalents that it takes to complete these courses. It can be seen that KFU, one of the two schools with the smallest number of total credit hours (165) has in fact the best ratio of time spent on architecture and architecture-related subjects (4.4 years in real terms). KFUPM, the school with the greatest number of overall credit hour requirements (183), has in fact the smallest number of credit hours (118) devoted to architecture and architecture-related subjects in real terms, 3.1 years. Bearing in mind that students who graduate from schools of architecture in Saudi Arabia are considered fully professional architects without any further registration or practical training requirements, 3.1 years seems barely long enough to train a professional architect.

To accommodate the five year course, the credit hours of the schools have been reduced over the years. For example in KSU the number of hours was reduced from 211 initially to the present (1997-98) 175. The corresponding figures for the other Saudi architecture schools from their inception to the academic year 1997-98 are: KFU 189-165, KAU 180-165, and UQU 186-167. KFUPM has remained the same since its foundation although plans to reduce architecture course credit hours are imminent. The reduction will have an effect on the architecture rather than the non-architecture subjects because university and college non-architecture course requirements cannot be reduced.

University	KSU	KFU	KAU	KFUPM	UQU
Total credit hours	175	165	165	183	167
Total credit hours of non-architectural courses	28	21	25	65	39
Total credit hours of architectural courses	147	144	144	118	128
Average credit hours per semester.	17.5	16.5	16.5	18.5	16.7
Semesters needed to complete non-architectural courses	1.6	1.2	1.4	3.8	2.2
Real time on architecture courses (years)	4.2	4.4	4.3	3.1	3.9

Table 7.3: Real time on architecture courses (years).

Several respondents make the point about the structure or design of the curriculum that it is simply too short. The architecture teacher Haikal (interviewed 1998) states:

> The average duration of an architect's training in Saudi Arabia is four to five years. This limited duration does not allow the school to teach the student every aspect of architecture.

The teacher Rageeb (interviewed 1998) agrees:

> The duration of the programme is absolutely too short. The degrees we offer are professional degrees in architecture equivalent to the accredited programmes in architecture in the United States, which take their students at least eight years to complete. However, the duration of all the courses in the University here is five years.

Ishteeaque (interviewed 1998), a teacher with experience of practising architecture outside Saudi Arabia, also believes the curriculum is too short. He compares it with other countries:

> In other parts of the world the architectural training programme is at least six years . . . but in this school we have a three-year programme.

Siddiqi, another foreign teacher (interviewed 1998), adds his confirmation:

> Architectural education is given in English. The training in language takes a substantial amount of time. So effectively a year or two is lost completely in preparing the student for English. So a five-year architectural education is effectively just four years. Four years of education in architecture is not a professional degree.

The student Khaiat (interviewed 1998) also believes the curriculum is too short to be as valuable as it might be:

> The most important thing from the teacher's point of view is to cover the syllabus of the course but he does not have the time to do so. The duration of the course is too short for the amount of information we get. That is why we cannot study and digest the information we get from the courses in order to apply it in the design studio.

There is in fact no government regulation stating that an architecture course has to be of five years' duration. But despite the fact that the schools have recognised that it is unrealistic to accommodate the long curriculum in such a short period as five years, attempts to increase the length of courses are considered to be not worth while, as they would be likely to act as a disincentive to potential architecture students. The teacher Haikal (interviewed 1998), for example, comments: 'If we make it any longer the student will not see it as rewarding to become an architect.' Haikal's solution is better curriculum management from above. The teacher Mohammed-Ali (interviewed 1998) explains the situation:

> This [the course] was six years in the past, but now it has been reduced to five years because of the market - demand and supply. Ten or fifteen years ago there was plenty of work for architects, but now the competition is much greater and jobs are fewer. Medical students study for six years, and then in the seventh year they become residents for hospital training, for which they receive a salary. When they graduate they are employed for SR 13,000. Architects, when employed, get SR 6,000. When the medical graduate is employed he is employed at the eighth grade; the architect is employed at the seventh. The reward is different, my friend. If an architectural graduate is employed in any government agency he cannot augment his salary by working part-time in another practice because the government does not want a conflict of interest. However, a medical graduate can be employed in a government hospital, and yet also work as a part-time consultant in a private hospital. That is why we are getting fewer and fewer students every year.

Sulaiman, another teacher (interviewed 1998), agrees that it would not be advantageous to increase the length of the course:

> The students would not be rewarded for the extra year. Medical students, when they graduate, are employed at a higher rank. Also the job market is not very good at the moment, so that the student would like to graduate as quickly as possible to go and find a job. Also there is not a high enough regard from society for the quality of an architect's work.

7.9 Practical Training

Schools of architecture in Saudi Arabia require from their students a period of practical training in an architecture office usually between their fourth and fifth years. This period is know as the 'summer training'. Following the completion of this training, the student is required to produce a letter from the office attesting that he has undergone it.

However, this summer training is generally regarded, by students, teachers, and practitioners alike, as most unsatisfactory. For one thing, it is usually of very short duration, the period varying between four and eight weeks. Furthermore, it is not supervised or monitored in any way by the architecture school concerned, without any list of areas to cover, or any guidelines for the office, or any record (such as the RIBA logbook on the UK) of what the student has experienced. The choice of the office is normally left to the student. Because it is such a short period and so poorly monitored it is hard for students, teachers, or the host office to take seriously, and the general opinion is that it is a waste of time.

Indeed the inadequacy of summer training is a constantly recurring theme in the fieldwork interviews. Such a short and ineffectual period of practical training is almost universally condemned by all the interviewees who touch upon it, whether architecture teachers, practitioners, or students, although a small number of students report some benefit in the way of learning about the day-to-day realities of architectural practice. There is, however, not quite so much unanimity when suggestions to remedy the situation are put forward. Some respondents advocate a longer course with practical training integrated into it. Some do not see it as the role of the architecture school, but as that of architectural practice, to provide practical training.

One problem with the summer training, as we have noted, seems to stem from the fact that it is of too short a duration to be of any value. Fadan (interviewed 1998), a university teacher of architecture, states baldly: 'The summer training required of a student before graduation is simply not long enough.' A similarly terse comment is made by the teacher Sa'ati (interviewed 1998): 'It is too short in duration, merely eight weeks.' This is echoed by the teacher Ghamadi (interviewed 1998): 'The duration of the summer practical training is merely eight weeks, and this is not enough.' The teacher Mohammed-Ali (interviewed 1998) has this to say about it: 'It is very short, and it is not organised or supervised by the School. I don't think there is any input beneficial to the student.' The teacher Hilton (interviewed 1998), commenting on the gap between education and practice in Saudi Arabia, says: 'The gap would be reduced if you had a period of professional practice longer than the summer training.'

Practitioners too are aware of the inadequacy of the summer training period. Rifai (interviewed 1998) states: 'Unfortunately it is not taken seriously because it is unorganised and too short.' Nwaeser (interviewed 1998) says of his own period of summer training that it was 'sixty days only. It wasn't of a great benefit to me.' Fayez (interviewed 1998) states:

> The period of practical training required by schools of architecture in Saudi Arabia is merely four to eight weeks. This duration is too short for a student to get anything from his office training.

Because the period of summer training is so short students and practices alike do not seem to take it seriously, and they simply go through the motions of attendance and documentation. The teacher Rageeb (interviewed 1998) states:

> We require a period of practical training at the end of the last year. The training, however, is only eight weeks and it is very poor. The students go to a practice office, but they have no systematic training there; they just pass the time with anything.

The teacher Hariri (interviewed 1998) comments:

> The four-week summer training is not adequate. Students just go through the motion of attending the office so that they can get the signed paper attesting that they have done so.

Mufti (interviewed 1998), a teacher, also believes that the school should monitor summer training:

> Unfortunately we have no control over the summer training; we only get the office's report on the student. Some of the offices used in training take it seriously, and others do not. But the School needs to go there and supervise the student.

Fayez (interviewed 1998) also comments on the attitudes of students who come to his office for their summer training. There is a sense among them that it is all a waste of time as it is presently arranged:

> The students nowadays lack the desire to learn when they come to their summer training. They lack the fighting spirit; they come to the office and spend the time there as a chore, something they have to do. When they come for their summer training I find that they don't take it seriously.

Students too are of the opinion that the period of summer training is quite inadequate. Ajmi (interviewed 1998) states simply: 'The summer training is very weak.' And Zinaigeer (interviewed 1998) emphasises the point that some other respondents make, that summer training is not taken seriously at all:

> When I had my summer training I felt that the office I was in did not care whether I showed up or not. So I used to go one day and stay away another. But at the end they gave me a signed letter to say I had completed my summer training.

Abu-Al-Khair (interviewed 1998) conforms that summer training is a pure formality:

> There is no supervision from the University in our training. We go to the offices just to get a letter to indicate that we have spent four weeks under their supervision.

Another student, Hilmi (interviewed 1998), indicates that the location where he undertook his summer training did not introduce him to anything new:

> I worked for the airport authority and when they discovered that I was a student they only let me work on design, away from the technical affairs.

The summer training period in Saudi Arabia is often contrasted unfavourably with other types or systems of practical training. One of these is the practical training that architecture students take in other countries. The practitioner Fayez (interviewed 1998) has this to say:

> Practical training is a crucial and important stage in the overall preparation of an architect. I have studied architecture at the University of Colorado at Denver. After that, I worked for three years in an architectural firm in Denver. This period of training gave me exceptional practical advantage over other graduates.

The teacher Haikal (interviewed 1998) states that the present Saudi summer training system might as well be scrapped, and compares it unfavourably with his experience elsewhere:

> Here in King Saud University the student is required to train in an office for six weeks. This has no benefit for the student, and eliminating it altogether will not change anything, since the student will not learn anything in such a short period in any case. In the University of Jordan we tried something different. During the summer we allowed the student to design a room, with all the working drawing details and specifications, and to build it together with all the craftsmen and using all the materials involved. This was much more beneficial.

Hilton (interviewed 1998), a foreign architecture teacher in Saudi Arabia, contrasts the Saudi practical training period with the UK system:

> The summer training here in Saudi Arabia does not seem to do what the year out does for UK students. In the UK there is a logbook and the students must fill all the boxes, including construction site supervision.

Various suggestions to remedy the practical training situation in Saudi Arabia have already been noted. Further suggestions include that from the teacher Bahammam (interviewed 1998) who indicates that the profession should take the initiative, including the introduction of a licensing examination:

> In the USA and the UK the student is required to do a period of practical training in an architectural office for not less than three and two years respectively. So I think that the problem is not with the school's academic training, but with the failure of the architectural profession to require further practical training and a licensing examination.

Another teacher, Sulaiman (interviewed 1998), follows up a comment that he makes on the short duration of summer training with practical suggestions including restructuring, appropriate monitoring of students, and a list of requirements to be covered:

> It [summer training] is very short, and very weak, and I think our summer training does not help the student and it is not beneficial to him. For the student is only required to bring a letter signed and stamped to state that he has done the course. We should have a structured practical training supervised by the schools, such as the one that colleges of education have where a member of the teacher staff goes and follows up on the trainee in the school, and they have a list of requirements that have to be covered in the teacher's practical training. When a teacher at a college of education is following up a student, then his teaching load is reduced accordingly.

And Sulaiman comments further:

> In Saudi Arabia the gap is wider between architectural education and practice than in other parts of the world. The reason, in my opinion, is that the students in other architectural education systems, especially in America and in Europe, take two years or more of practical training between graduation and registration as an architect. . . . When we compare medical with architectural education here in Saudi Arabia we find that the medical student does one year's residency in a hospital prior to graduation in addition to the practical work he has done in the hospital during his period of study. Unfortunately our students do not take this dosage of practical training prior to graduation.

The teacher Ishteeaque (interviewed 1998) adds a suggestion about the structure of training to his observations:

> We have a summer intern programme. But the students go and work any place, not specifically in an architecture office in which they would learn something more related to the field. It is just a fulfilment of a requirement. This softness of regulation does not help. The architecture curriculum should have a mandatory slot for training. Before he qualifies as an architect a student must do a one-year training, and after that the student should return to the school to do the final year. Definitely you will find that the student who has had exposure of one year's internship outside the school in a real architecture environment is going to do much better than the student who has not done that.

The practitioner Fayez (interviewed 1998) suggests:

> The summer training should be at least a year and it should be organised and supervised by the school. I can not over-emphasise the importance of practical training. The practice teaches the students the culture of the office. When he comes to the office the student begins to apply and understand knowledge and skills that he has learned only in theory and memorised in the schools. Architectural training in the past used to be undertaken in the office. Now architectural education is completely separated from the office.

Like some other interviewees Fayez also contrasts architecture practical training with practical training in medicine. He advocates a solution along the lines of medical training:

> The medical student studies in the school and practises in the hospital at the same time, so that there is no separation between the theoretical knowledge and its application. I think that all schools of architecture should have their own teaching offices attached to them. Or maybe the schools should organise with the local offices to train their students. One way or another I think the student should work and practise while they are studying; they should immediately apply the knowledge they gain in the school.

The practical training part of the route to the architecture profession in Saudi Arabia is therefore seen as inadequate primarily because it is too short and it is not supervised by the architecture school. Documentation consists merely of a letter from the office confirming that the student has shown up. There is no list of areas that have to be covered and no practical training record such as the log book of the British system (See Chapter 4) to be completed. Because it is such a short and uncontrolled matter, it is very hard for either student or office to take summer training seriously. Various suggestions have been made to remedy the situation, including integrating practical training with school instruction such as happens in medical training, and the deeper involvement of the profession in the training of students.

There can be no doubt that inadequate practical training is a major cause of the gap between architectural education and practice in Saudi Arabia.

7.10 Summary

Following centuries of traditional architectural training similar to the west's apprenticeship system, architectural education in Saudi Arabia was first developed to meet designer manpower shortages which were perceived to exist in the general climate of economic development in the country, spurred by the government's Five-Year National Development Plans.

Five universities now have a school of architecture. The first Saudi architecture school was opened in 1967 in Riyadh and became part of what is now King Saud University (KSU) in 1969. This school followed, at least initially, the Egyptian model in organisation and academic approach, since one of its moving forces was a leading Egyptian professor. Four other schools were established in the next three decades. Three of them followed a basically American academic pattern, and were established in King Faisal University (KFU), King Abdul-Aziz University (KAU) and King Fahad University of Petroleum and Chemicals (KFUPM). The last school to be established, the School of Islamic Architecture at Umm Al-Qura University (UQU) in Makkah, attempted to be different by offering a more integrated architecture programme, but this proved to be impossible to implement and it now follows the American pattern of the other schools.

The stated aims and objectives of the five architecture schools in the Kingdom show an uneven quality. Some schools indeed do not have current stated aims and objectives, relying on a repetition of what they stated several years ago. This suggests that a conscious consideration of aims and objectives does not feature largely in the thinking of those who run the schools. It also raises other questions, including whether the aims and objectives are appropriate to the society the schools are trying to serve, whether these aims and objectives are realistic, whether success in attaining them can be measured, whether means to attaining them have been identified and pursued, and whether the curriculum is designed to deliver these aims and objectives.

KSU has the greatest number of architecture students, being in any case the largest university and being situated in the capital city of Riyadh, and KFUPM the smallest, to some extent due to its wholly American system and insistence on teaching in English.

There is some dissatisfaction amongst teachers with the quality of students now entering schools of architecture, and many critics link this to the admissions policies of the universities. It is felt by interviewees that many students lack interest in or aptitude for architecture, and that there ought to be a better screening system for potential students. The fact that only students with a science background are accepted for architecture courses is also a drawback. One difficulty is that the schools of architecture have no control over what students they accept. They have to take those who are sent by university admissions offices. In general the feeling amongst architecture teachers is that there are now too many students and that too many are them are not suited to the study of architecture, something which also has implications for the profession of architecture.

There is great dissatisfaction amongst teachers, students, and practitioners about the fact that teachers in Saudi architecture schools are prohibited from practising. This is a constantly recurring theme in the responses of interviewees and is seen as a major factor in the isolation of training from the profession. It is regarded as one of the main causes of the education/practice gap, as is the fact that Saudi architecture teachers are not trained as teachers.

Similarly, many references have been made by interview respondents to the fact that practitioners are not permitted to do any teaching, and it seems clear that this is a further reason for the gap. Although non-Saudi teachers may have had the advantage of experience in practice, this is often nullified by the fact that they are unfamiliar with Saudi cultural values, consideration of which is an important matter in architecture.

The physical academic environment, by which is meant the library, lab, and computer resources and the physical surroundings in which teaching and learning have to take place, vary greatly from architecture school to architecture school. While some schools lack proper resources, there is not always full use made of them in those where they are available. In some cases there are no trained technicians to staff labs and workshops, and the lack of resources is generally linked to shortage of money to pay for them. There is some variation between schools in terms of the general campus environment and some schools are felt to offer more pleasant overall surroundings in which to study.

Practical training, which consists entirely of the so-called 'summer training' is universally believed to of very little value. It is of too short a duration and is not properly monitored by the schools with the result that it not taken seriously by students, schools teaching staff, or practitioners.

Course duration is the same in all the Saudi architecture schools, and at first the courses of the different universities seem very similar in structure. However, in real terms the number of credit hours actually spent on architecture subjects, as opposed to subjects of general university requirement, varies from school to school, with as little as just over three years spent on architecture subjects at one school (KFUPM). Attempts to increase the duration of the architecture course, however, may meet with resistance as they may discourage students from studying architecture.

Chapter 8

The Architecture Curriculum and its Saudi Arabian Context

8.1 Introduction

In Chapter 7 we examined architectural education in Saudi Arabia and its relation to practice in general, looking at development, admission policies, physical and human academic resources, practical training, and the length and structure of the course. We related each of these elements to the context of architectural practice in Saudi Arabia. In this chapter we will take the study to a deeper level to look specifically at the architectural curriculum and its relation to practice. This chapter will give a comparison of the curricula of Saudi schools of architecture and an analysis of the interviews to relate them to architectural practice in Saudi Arabia.

Comparing the total credit hours of different curricula, as we have done with course duration in Chapter 7, will not in itself suffice for us to understand the similarities and differences in the programmes between different schools of architecture. It is through analysing the curriculum that we will be able to set the stage for the discussion generated from interviews with teachers, students, and practitioners of architecture.

Any comparison has to be based on certain standards that are common to the programmes under consideration. For the purposes of the present study, therefore, a classification system which recognises the basic subject divisions and their sub-divisions has been developed, based on an analysis of the semester-by-semester curricula implemented in 1997-98 in the various schools of architecture according to their catalogues (See Appendix IV). This particular year has been chosen as the benchmark, as it was the year in which the fieldwork investigation of architectural education and its relation to practice in Saudi Arabia was conducted. In this classification system courses that make up the curriculum of a school are divided into seven major groups and 17 subgroups as explained below:

1. Basic subjects: Islamic Studies, Basic Sciences, Physical Education.
2. Building Technology: Building Construction, Building Sciences, Structure.
3. Social Studies and Humanities: History and Theory, Context and Surroundings.
4. Project Preparation and Design: Design Theory and Methodology, Design Studio.
5. Communication: Written and Oral, Presentation Techniques.
6. Professional Practice and Management: Professional Practice, Construction Documentation.
7. Complementary Studies: electives, research and written dissertations, others.

The curricula were analysed following this classification and the credit and contact hours of all of schools of architecture were computed and distributed according to the system (See Appendix V). This will provide direct comparison of the credit and contact hour totals of different programmes for the granting of the first professional architecture degree in Saudi Arabia. The comparison will show the similarities and differences amongst the programmes. It will reveal the breadth and depth of the curricula, by indicating the credit and contact hours needed to complete each group and subgroup, and it will demonstrate whether the programme reviewed is technology-oriented or arts- and humanities-oriented. It will show the weight given in the various schools to professional practice, to the provision of elective courses, to the time to be spent on English language within the total curriculum, and so on. The information will be presented for each university in the form of statistical data and in graphs and tables generated from this data. In the case of KSU the presentation of data takes account of the different curriculum options available in the fourth and fifth years.[37] Each curriculum group and subgroup will be discussed below.

Following the comparison of the proportion of the curriculum given by each architecture school to each group an analysis of the subject group and the perception of teachers, students and practitioners of it will be given, based on the researcher's fieldwork interviews. Attention will be paid to the effectiveness of each subject group in terms of the performance and competence of the students and graduates and how it

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[37] All students study the same core programme, but in the fourth and fifth years students may choose either an architectural design or a building science option totalling 12 credit hours, three credit hours a semester.

prepares them for architectural practice. If shortcomings are found then an account of the nature of these shortcomings and their causes will be elicited from the interviews together with any other particular points made by interviewees about the group in the context of its relation to architectural practice.

8.2 Basic Subjects

This main group consists of subjects that are not architectural or architecture-related, but subjects which are university and college requirements. Subgroups within this main division include Islamic studies, covering the study of Islamic culture and ideology, the study of Islamic law *(Shari'a)*, and the study of the Quran and the sayings of the Prophet (*Suna*). A further subgroup is Basic Sciences, which covers Maths, Physics, and Calculus, and another is Physical Education.

Fig. 8.1 indicates the distribution of the credit hours and contact hours for the Basic Subject groups and subgroups at the Saudi architecture schools. It can be seen that KSU (17 hours, 9.71% of the total), KFU (18 hours, 10.9% of the total), and KAU (16 hours, 9.69% of the total) have similar credit hour distributions.

However, KFUPM has 34 hours (18.57% of the total) and UQU has 31 hours (18.56% of the total) in this category. The reasons for this are that KFUPM devotes many hours to the subgroup Basic Sciences (22 hours), having been originally a technical university, and also because it has an orientation year in which it requires all first year students of all subjects to study in the English language the same basic science areas as they studied at high school. Furthermore, Physical Education is greatly emphasised at KFUPM (six hours), so that it also contributes to the time that is taken out of the total number of available credit hours. Indeed, when contact hours are taken into account it takes up an even greater proportion of the potential credit hour time available (12 hours) to architecture students.

As for UQU, it too displays a high number of total credit hours devoted to Basic Subjects. Some of this is accounted for by Basic Sciences (six hours), but it is mostly devoted to Islamic Studies (25 hours). The reason for this emphasis is that UQU was originally founded as an Islamic university, and is the home of the oldest *Shari'a* school in Saudi Arabia. UQU continues this Islamic tradition for students in all its current subject areas.

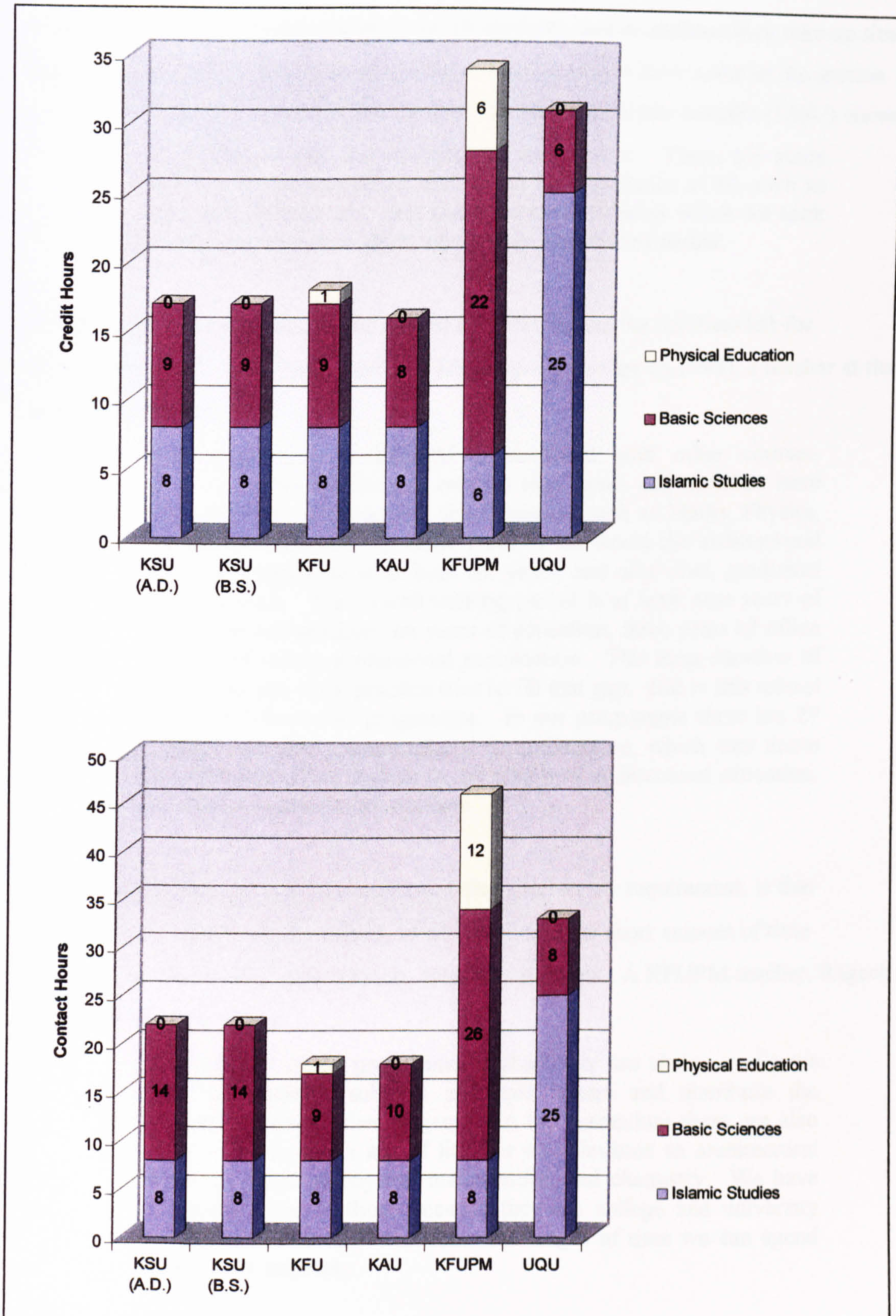


Fig. 8.1: Credit and contact hours distribution of Basic Subject subgroups.

Basic Subjects are often seen as irrelevant by students, and in addition they take up time from the architecture and architecture-related courses, as we have noted in the section on course length and structure (See Chapter 7). The student Bin-Mahfoz (UQU) states:

> It is hard to see the relevance of some of it. There are some subjects in the curriculum that are of no importance at all, such as Calculus, Physics etc. But there are some subjects which we took in the last two years which we wish we had studied earlier.

The problem is more intense in the case of KFUPM, where the real time left for architecture is 3.1 years (See Chapter 7) Ishteeaque (interviewed 1998), a teacher at that school, comments:

> Our programme in KFUPM is burdened with other courses, whereas in the architecture courses their loads and numbers have been reduced. I am talking about courses such as Maths, Physics, Islamic courses, etc. In other parts of the world the architectural training programme is at least six years, and after that, graduates pass an exam. The overall training period is at least nine years of education and practice: six years of education, three years of office work, and then a professional examination. This long duration of education and work practice tries to fill that gap. But in this school we have a four-year programme. In our programme there are 27 credit hours that are not related to architecture, which cuts down the exposure of the student to the course of architectural education. It is like a three-year programme.

The effect of these Basic Subject courses, being a university requirement, is that architecture programmes are altered, to accommodate the short amount of time available, by eliminating some subjects, splitting others etc. A KFUPM teacher, Rageeb (interviewed 1998) states:

> The duration of the programme is absolutely too short . . . So we have to eliminate subjects and split others and distribute the contents between other subjects. In the curriculum there are also some subjects which are of little or no relevance to architectural education, such as physics, mathematics, and chemistry. We have to satisfy some of those because they are college and university requirements, which also reduces the length of time we can spend on the core subjects.

Basic Subjects, then. are felt by both students and teachers to be irrelevant to the overall training of architects and to limit the time available for architecture courses. However these subjects could, by co-ordination and organisation, be used as a vehicle and basis for architecture courses. They could be linked to architecture courses in such a way that the student can see their relevance. For example Islamic Studies could be an excellent vehicle to teach architects about the influence of Islamic beliefs on the built environment. Likewise, physics and mathematics could be used as a basis for other science architecture subjects such as structure or building science.

8.3 Building Technology

Subjects that deal with the nature of materials, their production and their assembly together in single elements, components, individual units or groups of units, form the content of this group. The subgroups within this group include Building Construction, covering architectural construction, architectural details, materials, and building systems. A further subgroup is Building Sciences, covering environmental control systems, mechanical and electrical installation, lighting and acoustics, energy conservation, and sanitary services. A third subgroup is Structure, covering statistics and strength of materials, structural analysis, structural systems in architecture, etc.

Fig. 8.2 indicates the distribution of the credit hours and contact hours for the Building Technology groups and subgroups at the Saudi architecture schools. It can be seen that apart from KSU, all the schools show a similar distribution. The statistics for the various schools are: KFU, 26 credit hours (15.75% of the total), KAU, 20 credit hours (12.12%), KFUPM, 23 credit hours (12.56%), UQU, 25 credit hours (14.97%). At KSU the number of credit hours devoted to this subject group are approximately double those shown by each other school, 37 credit hours in the Architectural Design option (21.14%), and 49 credit hours in the Building Science option (28%).

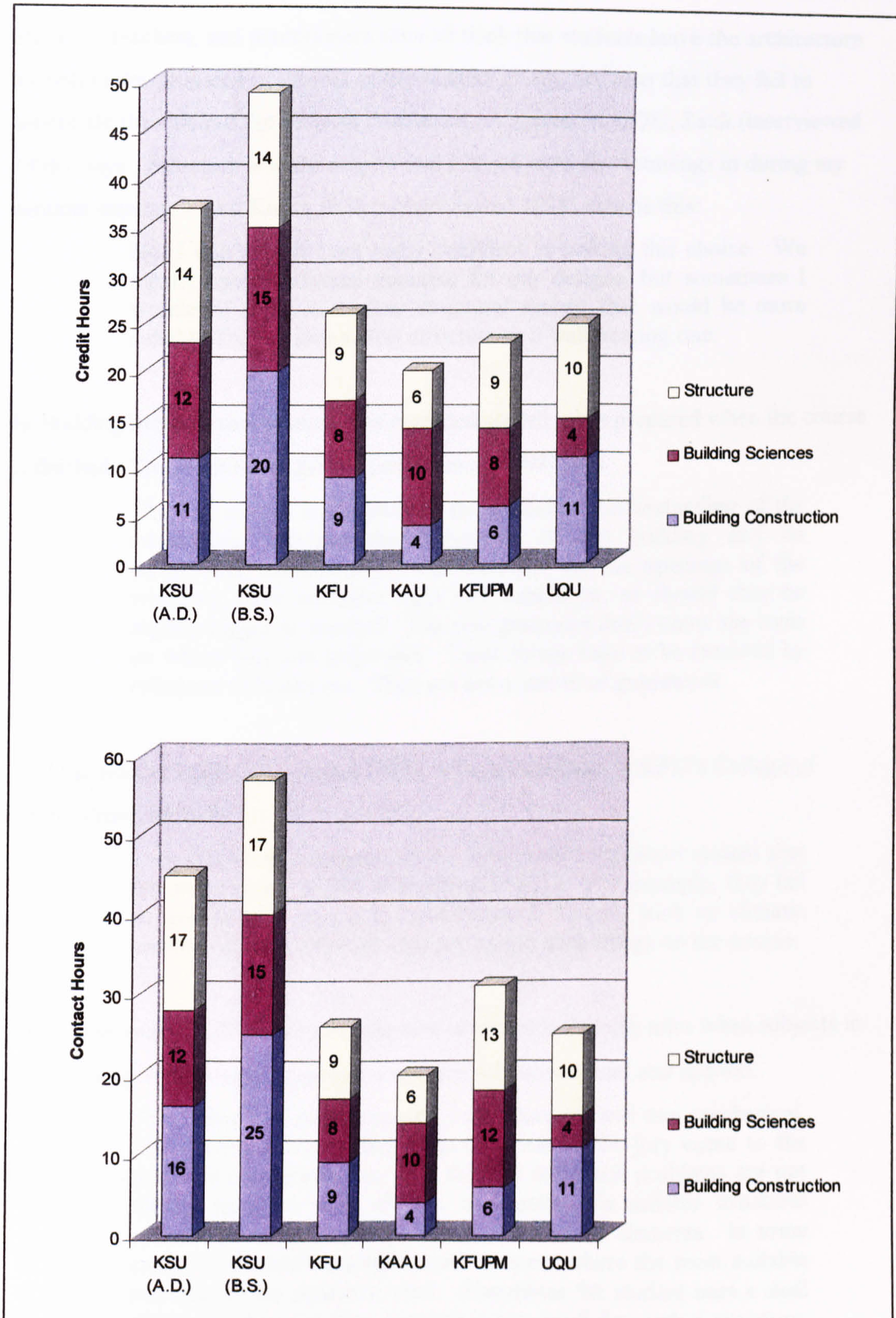


Fig. 8.2: Credit and contact hours distribution of Building Technology subgroups.

Students, teachers, and practitioners alike all think that students leave the architecture schools under-prepared in courses of this subject group, and also that they fail to appreciate the value of the subjects concerned. A student at UQU, Zaidi (interviewed 1998), says: 'Structure was the subject that I found most shortcomings in during my summer training.' And Kazim (KFU) (interviewed 1998) echoes this:

> No, I don't think I am really confident in making this choice. We mostly used reinforced concrete for our designs, but sometimes I wonder if there is another structural system that would be more suitable, for instance a steel structure or a wall-bearing one.

In Building Science, too, students are regarded are left underprepared when the course is finished. The practitioner Shoabi (interviewed 1998) says:

> There is also an inadequacy in the graduates' understanding of the relationship between the interaction of the building and its surrounding environment. For example, do the openings of the windows allow sufficient light and ventilation, or should they be slightly bigger or smaller? The new graduates don't know the basis on which they can judge this. These things have to be resolved by reference to books etc. They are not a matter of guesswork.

And the teacher Lyali (interviewed 1998), who is Vice-Dean at KFU's College of Architecture, remarks:

> I would like to comment on the environmental control system that the students are taught in Building Science. For example, they fail to give proper regard to environmental factors, such as climatic conditions, even although they are taught such things on the course.

Lyali (interviewed 1998) illustrates the sort of situation that can arise when subjects in the Building Technology category are not properly understood and applied:

> I will give you two examples, one structural and one mechanical. The structural one is that when members of the jury come to the School from outside they find that the structural problems are not solved, from the point of view of selecting the suitable structural system and the approximate sizing of structural elements. In some cases the student uses reinforced concrete where the most suitable material for his project is steel. Sometimes the student uses a shell structure when the area covered is too small for such a structure. On occasions the students in large spans still use beams when they could have used a waffle structure. When the jury asks a student why he did this when he could have used a system more economical than the one used, he cannot give an answer.

> The mechanical example is that the student fails to choose the right air-conditioning system for his design; also he fails to do the approximate calculation of the sizes of air-conditioning units he needs and the sizes of the ducts. So we find the projects of the students are good from the point of view of the floor plan, but on the other hand they are not good from the practical point of view; the problems are not solved.

The Building Technology subjects appear on the face of it to be of some importance and they take up a fair percentage of the curriculum. It is puzzling, therefore, why they are held in such low regard. The answer would appear to lie partly in the subject content and partly in its delivery. Some of the subject content is regarded by some interviewees as irrelevant. The practitioner Kamfer (interviewed 1998) states:

> Further, take the subject of electrical fixtures. What we studied was irrelevant to practice. We studied, for example, amps and ohms like electrical engineers do. In practice what I need to know is how I can distribute my lighting fixtures in a space, how the artificial light will interact with the natural light, what number of lights I need in a room, etc.

He adds:

> Also, on the subject of mechanical fixtures, architects in practice need to know the amount of air-conditioning required to make the room comfortable, and how the openings and ducts would affect other design features, such as the height of the ceilings.

But even when the importance of the content is appreciated, the way this content is delivered evokes criticism. The UQU student, Nawawi (interviewed 1998), for example, comments: 'Some of the subjects that *are* relevant seem to be poorly designed. In Structure for example, there are too many courses but too little benefit.'

When asked why students do not have a grasp of the notion of structure the KFU teacher Ustankok (interviewed 1998) replies:

> Because Structure is taught to architectural students in terms of civil engineering calculations of the critical sections of columns and beams, instead of as the conceptual understanding of structure, such as what sort of structure is appropriate for what sort of building design without necessarily going into the calculations involved. An architecture student is not going to function as a civil engineer. There will always be a civil engineer to help the architect

> in the calculations, but the civil engineer will not help the architect with the notion of what structure is appropriate for the space he is designing for a particular project. This is where we lack the full understanding of structure in our students.
>
> That is why in the design studio one can see that our students are not enriched in their thinking with the correct structural concepts. However, in their courses they are getting good grades because they know how to calculate. But that is not what we expect from them and neither is it the thing that is expected of them in practice. No one asks the architect to calculate the cross section of the column when they start working in an architectural office. But they do expect you to choose the right sort of structure for the right sort of space for the right sort of money.

Other respondents are also critical of the fact that the content of the Structure course deals largely with calculations. For example, the practitioner Kamfer (interviewed 1998) states:

> Structure is taught from a civil engineering point of view. The Structure teacher used to teach us calculations – how to calculate spans, columns, foundations, etc. But these are not what the architect needs in practice. The architect does not do the structural analysis of a building. He needs to know the approximate sizes of the structural elements, and he needs to know the structural vocabulary through which he can interact with the structural engineer. Most importantly, the architect needs to know the potentialities of structural systems so that he can ensure his design concept is buildable, and what structural systems are most suited to his designs in terms of economy, construction, etc.

A student, Bugdadi (interviewed 1998), says much the same: 'The structure is in one valley, the design in another. In Structure we study only calculation, but not practical solutions.' Hindi, a student (interviewed 1998), corroborates this. He comments:

> In Structure we studied only calculations, and we didn't apply it in the design studio. We do not know how to choose the right structure. For example, in large spans we use reinforced concrete without awareness that the beam could be one and a half metres deep. If we used another structural system it would be more suitable.

Another respect in which the content courses in this subject category is questionable is that they deal with materials that are not relevant to Saudi Arabia. Kamfer (interviewed

1998), a practitioner, points out that in his days as a student the curriculum covered structural materials that were not used locally:

> In Materials, we studied materials that are not used in Saudi Arabia, for example wood (on which we spent a whole semester). In the Materials course we needed to study what materials were actually available on the market, what their costs and potentialities were, and so on.

This is reinforced by the teacher Haikal (interviewed 1998):

> Still we are teaching Mitchell and McKay, wood construction, and details that are not used here. Go to any graduate and ask him to draw a cross-section in a marble floor. I assure he doesn't know how to do this, because he was not trained to do it. Instead he was taught to draw details of the queen post and the king post, and ever since the subject of Construction was introduced to the curriculum it has never been developed, and it has never been indigenous.

The practitioner Kamel (interviewed 1998) is also concerned that students are not trained to utilise indigenous materials:

> The practices the student are taught in the schools in our universities are all imported from abroad, and they are not harmonious with our environment . . . When the students specify materials for a project, they specify materials in such a way that have to be imported from the abroad, because that is all they are familiar with. They cannot specify materials that are available locally, and can be made by local craftsmen.

As with some other subjects, the link between Building Technology subjects and the design studio is not always made clear. The KFUPM student, Kayali (interviewed 1998), states:

> In the jury they ask you about the type of structure you are using. Sometimes we choose the type of structure, but we don't know is it is the right one, suitable for the design. So, again, there is no application of what we study in other subjects in the design studio.

And the KFU student Atiah (interviewed 1998) remarks:

> There are some technical subjects that we don't know the value of, such as lighting, and electricity. We know that these subjects are important, otherwise they wouldn't be in the curriculum, but we have never applied the knowledge we gain about them in the studio.

Ghanim, a student at KSU (interviewed 1998), comments:

> I will give you one example to show you that there is no integration between the subjects of the curriculum and the design studio. I was supposed to study the mechanical course in the third year. However, I did it in the fourth year, the same year we did the System Design studio. In that particular studio we were supposed to do a design for a project and to do the working drawing and architectural details of the project, including the selection of the air-conditioning system. So I tried to apply the knowledge I was learning in the mechanical course, such as the selection of the air-conditioning units, the sizes of the ducts, the location of the openings, etc. The teacher of the design studio, however, asked me to do it in a different way.

Ghanim states in fact that students are absolutely in the dark about such matters as the selection of a suitable structural systems, air-conditioning, plumbing, electrical methods, etc. When asked why he replies: 'The problem is that there is no integration between the theoretical subjects themselves, and there is no link between these courses and the design studio.'

The student Johani (interviewed 1998), from another architecture school (KAU) indicates that he feels there is no integration of Building Technology subjects with the design studio:

> We studied Structure, Construction, and Working Drawing courses, but there was no link between the three. There should be a Structure teacher in every design studio to follow up whatever we got from the three courses and make sure that we understand them and apply them in the design studio.

And, in response to another question from the researcher:

> As for air-conditioning we studied that, but did not apply it in the design studio. We just know that we have to leave extra room in the ceiling for it. I think that, when we study air-conditioning and lighting, we should take a project and do all the calculations for that project so that we don't forget it.

Kutbi (interviewed 1998), another student in the same school, states: 'We studied water and heat insulation in Building Science, but we were not asked to apply them in the studio.'

Recalling his student days the practitioner Rifai (interviewed 1998) says: 'We studied all of these [Building Science subjects] in the form of separate courses, but they were all theoretical; they were not linked to the design studio.'

The complaint that what is taught in the classroom is just theoretical in the sense that it is not applied in the design studio receives wide support from teachers. The teacher Fadan (KSU) (interviewed 1998) comments:

> The students are taught only the theory of certain disciplines without any practical content. In other words, they are taught on the blackboard, not in the design studio. The result is that they do not know how to apply the theory in practice.

The KFU teacher Hilton (interviewed 1998) claims that the correct information is taught but does not get applied in the design studio: 'We teach the students all the time about passive solar energy and sun devices, but when it comes to the design you see these things missing from their drawings.'

Tarim (KAU), another teacher (interviewed 1998), believes that teachers should make it their business to go to the design studio to make sure that what they taught in theory is being applied there:

> In the case of mechanical systems the teacher should come to the design studio and see to it that the students are applying the knowledge he has transmitted to them, and that it *does* manifest itself in the design studio.

Yet another teacher, Ghamadi (interviewed 1998) of KSU, picks out the failure to translate classroom instruction of Building Technology subjects into design studio performance:

> Here, in our school of architecture, the structural courses are taught as a separate discipline, and the students are not asked to demonstrate that they have understood, and to apply their knowledge in the design studio.

Akbar (interviewed 1998), the Chairman of the Department of Architecture at KFU, also acknowledges that the design studio link is missing:

> The thing is that there is no link between the different subjects of the curriculum and the design studio. The students, for example, study structural analysis. Some of them pass their exam with an 'A+' grade. However their work in the design project does not reflect the 'A' they got in Structure. For instance a student will learn in Structural Analysis about various types of structures, but when it comes to his design project he will always choose a reinforced concrete option with columns and beams, whereas for his project a load-bearing wall design might have been more appropriate. Moreover the student does not even know how to do mechanical calculations, such as how many tons of air-conditioning are required to cool a room, and the depth and length of the air-conditioning ducts.

The KFU teacher Ustankok (interviewed 1998) also looks to the design studio to bring subjects together. However, he stresses that there is also a need for greater concern for integration within the Building Technology subjects themselves; it should not be left to the design studio alone:

> Take for instance the relationship between the structural concept and construction material. You cannot really separate the two, and if you are dealing with the building envelope you cannot really isolate them from the means of environmental control. So these three things should come together, but we ordinarily expect to separate them and expect the design studio to be the place where all these things come together. But I have a feeling that perhaps within each of these courses there might be a better correlation and co-ordination, so that the students would be less inclined to keep them as separate courses in their minds, and to retain as separate areas the information gained from them, which doesn't come together on the design table. So if we can co-ordinate them better and put the relationship between the courses more vividly in the minds of students then the students will be able to synthesise the information in the design studio.

It is not just the content of the subjects or whether they are applied in the design studio that interview respondents are concerned about. The delivery - in effect the teaching - of the information is also thought by many to be suspect. The teacher Lyali (interviewed 1998), the Vice-Dean of the College of Architecture at KFU, is of the opinion that subjects are being taught by the wrong teachers. He also favours allowing practitioners to do some teaching:

> The teaching method is important for the delivery of the subject to the students. Take Structure for example. Structure is taught by a Saudi civil engineer, a Professor in the Department of Building

> Technology. In the teaching of the subject the emphasis is on calculation of structural members. But the Professor does not understand the relationship of structure to architecture, and how the design is influenced by the structural system the architect uses. . . . The teachers from the Civil Engineering Department deal with students of architecture just as they deal with civil engineering students. So some of the students now know how to do calculations of several architectural members, but all of them fail to choose the right structural system, from an economical point of view, and from the point of view of the effect of this system on the design. To solve this problem, Structure should be taught by teachers from the Department of Architecture. Also we should invite part-time practitioners from practice to teach the students how the structural problems are solved in real life.

Lyali goes on to make some general comments about teachers, applicable not just to the teaching of Building Technology subjects, including the point that there are not enough teachers to deliver the curriculum adequately and that teachers are not trained to teach:

> Three points I would like to make about the teachers. The first one is that the teachers are too academic. They lack knowledge of the practicalities of architecture because they are not allowed to practise. The second point is that the teaching staff is too small in number to support all the requirements of the curriculum; some areas are not covered adequately because we have no teacher who specialises in them. The third point is that our teachers are not in fact trained as teachers. They simply come to the University with a Ph.D. and start teaching. They use only traditional teaching methods such as the one-way lecture method. They don't make use of teaching aids such as audio-visual materials, or take students on visits to sites to see whether what they have been taught has been grasped in a practical way.

The teacher Akbar (interviewed 1998) believes that some teachers do not even know their own subject: 'In fact the teachers who teach heat and water insulation do not even know what types are available in the market.'

As might be expected, students have a great deal to say about teachers and the teaching of Building Technology subjects in Saudi architecture schools. The KSU student Faris (interviewed 1998) is critical of teaching methods, which he feels are too tied to the classroom, without demonstration of practical application:

> Too reliant on classroom work, for one thing. . . . For example, I studied reinforced concrete structure here in the school, I passed the exam and I gained an 'A' in that course, but we did not see how

> it is constructed in practice. We studied on the blackboard how the steel should be arranged etc. but we did not see it in practice, nor in photos, models, nor on the site. The School should take us to a construction site or use photos, models and labs to make the theoretical information we are taught more tangible and comprehensible.

This view that teaching is too one-dimensional, too much a matter of lecturing or 'blackboard' teaching is prevalent. The student Hilmi (interviewed 1998) is concerned about this, and believes that there is not sufficient discrimination of the most appropriate teaching methods for different subjects:

> The problem is that some of the subjects are best taught in the class, others should be taught in the workshops or labs, and others should be taught only on the site, such as Construction. We should be there to see how materials are handled, how the building is put together, and so on.

There is a general feeling that more 'on the spot' teaching should take place, whether in facilities provided by the school or outside. Khaiat (interviewed 1998) states simply: 'The teaching is theoretical, without site visits.' Atiah (interviewed 1998) makes a plea for better delivery of content from the teachers: 'I wish that the information we get in the courses was supported by audio-visual aids, or site visits, or models.' In another response he states: 'We always wanted to go to a site to see how buildings are constructed, but unfortunately we did not do that.' Kazim (interviewed 1998) also wishes for a more practical teaching approach, with appropriate visits to sites and exhibitions:

> I wish we had been taken to a site where an actual roof was being constructed. Also I wish that we had a material exhibition so that could see with our own eyes the different materials that go into construction, for example what water insulation looks like, or heat insulation, or a membrane.

A KFU student, Zinaigeer (interviewed 1998), stresses the value of imaginative teachers:

> The Structure instructor we have now has only had one year's experience; he has recently graduated Ph.D. We had a previous one, Dr. Mohammed Shalbi, who had thirty years' experience in teaching Structure to architecture students, and he used to link structure to architecture, how to choose the right structural system for a design. He used to take us on site visits to see how a structure

> is constructed. He used to use slides, videotapes, and models, to make the subject really clear in our minds.

Dr. Shalbi's teaching approach is also commended by the student Ajmi (interviewed 1998):

> Yes, Dr. Shalbi also did not proceed to another topic unless he made sure we had understood the previous one. He used to tell us that if anyone did not understand what he had said he should say so, because if he proceeded the chance would have been lost. He used to say: 'I can use the whole semester just to explain one topic if necessary, rather than waste it teaching ten without any of it being understood.'

The student Najar (UQU) (interviewed 1998) believes that familiarity with practice is required to teach Structure well:

> I think it has to do with there being no link between the teacher and the world of practice. Take, for example, the teaching of Structure, which is problematic, as some of us have mentioned. The best teacher we have ever had was Mr. Isam. Because he works in the Project Management Department in the University, he is practical, and because he is practical he teaches us the information we need to know when we start our career after we graduate.

Ghanim (KSU) (interviewed 1998) also comments on teaching in relation to Building Technology subjects:

> The quality of the teacher, whether he practises architecture or not, determines the quality of the course. For example, when we studied mechanical systems with a teacher who was out of touch with practice, the information we were given was old and not relevant to the reality of practice in Saudi Arabia. There are new air-conditioning systems in the market now. But the systems we studied were old. The content of the subject remained the same for twenty years. The handouts we are studying from now are the same handouts that were used fifteen years ago.

The practitioner Rifai (interviewed 1998) also finds fault with the teaching of Building Technology subjects in his student days: 'Some of the teachers use the lecture as the only means of teaching.' This point is also taken up by the practitioner Kurdi (interviewed 1998): 'When we studied architecture the teachers never took us to make site visits to experience the reality behind building construction.'

Some practitioners are also critical of the teaching of subjects in this group in the Saudi architecture schools. Kamfer (interviewed 1998) says:

> And we were taught this subject [Materials] by teachers from the Civil Engineering Department, so they weren't aware of what information architects needed to know. In fact these teachers were often from overseas and were not exposed to the Saudi market.

It is widely considered that insufficient use is made of lab and workshop facilities, another factor in the general failure of students to understand and apply the content of the subjects in the Building Technology category. The teacher Fadan (interviewed 1998) and former Chairman of the Department of Architecture at KSU states:

> As for the labs, they are not fully utilised because, as far as I know, the teachers do not encourage their students to use them, and by that I mean that the labs are not incorporated in the teaching methods of the subjects. The subjects ought to be taught practically, but instead they are only taught theoretically. For example, Structural Analysis is taught on the blackboard, whereas it should be taught in the structural lab. Further, building science matters like heat insulation, sound, etc. are also simply taught in the classroom, where they should be taught in the labs.

The KSU student Assaf (interviewed 1998) states on the subject of the reluctance of teachers to use labs in teaching:

> When we ask the teachers about the labs, they tell us go with the teaching assistant and he will show it to you. I will give you one example of their attitude to labs. Although we have a fully equipped structural lab the teachers never took us to it. When the Structure teacher wanted to indicate to us how a reinforced beam would perform when exposed to certain forces, he used a role of drawing papers to show us.

Pressure on teachers because of the number of credit hours that have to be completed is another matter of concern. Addressing the question why teachers do not use labs enough or take students on site visits the teacher Sulaiman (interviewed 1998) says:

> The reason for that, in my opinion, is the large number of credit hours that have to be put in, and the large amount of courses that have to be finished in a semester, and the load on the teachers and pressure on the students to complete them.

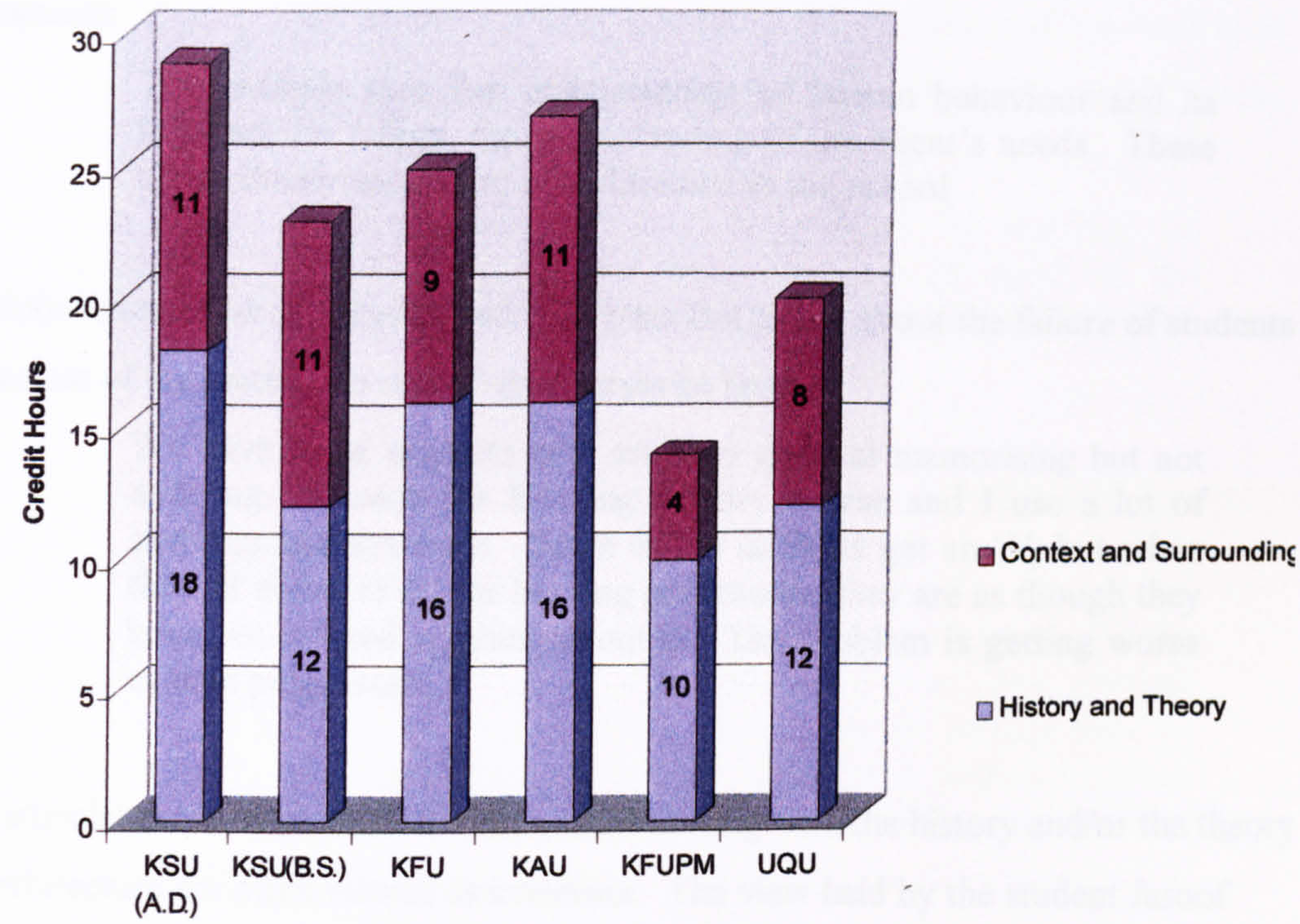
The student Jamaz (KSU) also illustrates the general attitude to lab work: 'Also our visits to labs are not credited to us towards our final grade of the subject, so there is no encouragement for us to go to the lab and use the equipment.'

An analysis of the content and delivery of the Building Technology part of the curriculum helps to clarify why there is a gap between architectural education and practice in Saudi Arabia. The subjects seem to many to lack relevance, dealing with materials that are not used in construction in Saudi Arabia or with areas of building that are not the province of the architect. In addition, even if the usefulness of the subjects is perceived, there are inadequacies in their delivery. Teachers are too tied to the classroom and the blackboard instead of being ready to lead site visits and to utilise other more effective teaching methods. There is a reluctance to make use of lab or workshop facilities and a failure to integrate what is taught in the individual subject courses to the work of the design studio. There is the general teaching point, too, that teachers are not permitted to practise. All of these factors mean that there is a considerable distance between what is taught in the Building Technology courses and what actually happens in architectural practice, and that students are therefore under-prepared for the profession of architecture, in other words that there is an education/practice gap.

8.4 Social Studies and Humanities

These are non-technical subjects that deal with ideological, theoretical or methodological concepts and attitudes in relation to the built environment. These subjects falls into two subgroups. The first of these is History and Theory, covering general history, the history and theory of architecture, courses in humanities, psychology and sociology in architecture. The second subgroup is Context and Surroundings, a study of the urban and surrounding environment covering landscape architecture, urban design, housing, and planning.

Fig. 8.3 shows that the KSU architectural design option displays the greatest number of credit hours devoted to this group (29 hours, 16.57% of the total), which is to be expected in a course of this nature. KFUPM students receive the least exposure to this subject group (14 hours, 7.65%) since the KFUPM is a technical university and its emphasis therefore lies away from non-scientific subjects. UQU is shown to rank fourth in the emphasis given to this subject area (20 hours, 11.97%), a surprise finding in view of the fact that the architecture school there was instituted as an Islamic architecture school, and more stress upon historical and theoretical areas might have been expected. The statistics for the other schools are: KSU building science option, 23 hours (13.14%), KFU, 25 hours (15.15%), KAU, 27 hours (16.36%).



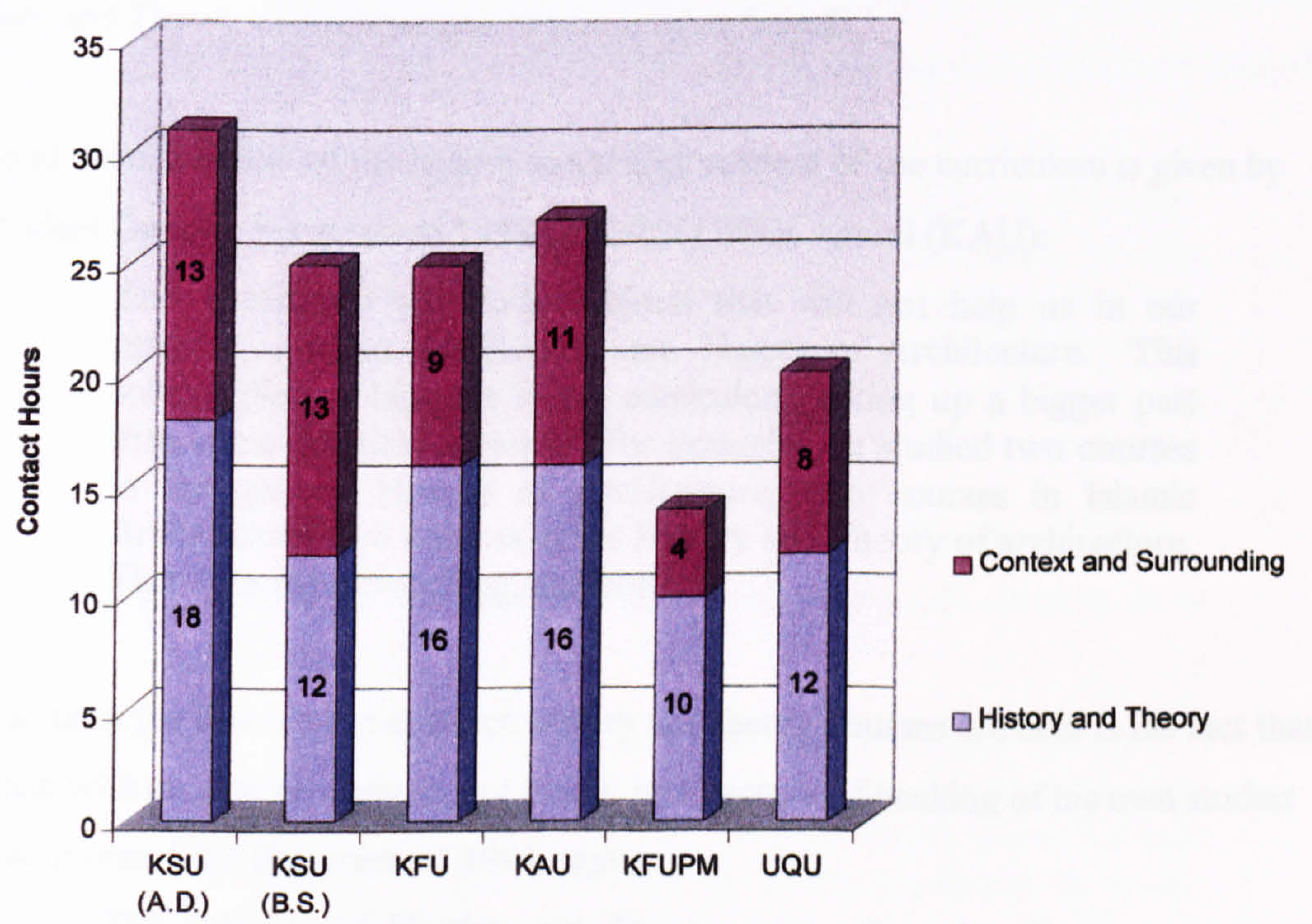


Fig. 8.3: Credit and contact hours distribution of Social Studies and Humanities subgroups.

In this subject group, students often fail to see the relevance of its subjects, as indeed do some of the teachers and practitioners. The practitioner Fayez (interviewed 1998) comments:

> The students lack due understanding of human behaviour and its influence on design, the understanding of the client's needs. These things unfortunately are not addressed in the school.

And the teacher Hilton (interviewed 1998) has this to say about the failure of students to make use of the material in one of the courses he teaches:

> We have some students who are very good at memorising but not applying. I teach the Housing Theory course and I use a lot of sketches and drawings. Some of the students get an 'A', but when they sit down to do the housing programme they are as though they have not learned anything about it. The problem is getting worse as time progresses.

In particular those sections of the curriculum dealing with the history and/or the theory of architecture are often viewed as irrelevant. The view held by the student Jaroof (interviewed 1998) is typical: 'Some subjects seem of little relevance. For example, the History and Theory of Architecture course is of no benefit.'

A round condemnation of the history and theory content of the curriculum is given by the student Gazawi (interviewed 1998), speaking of his school (KAU):

> And sometimes we study subjects that will not help us in our practice, such as the History and Theory of Architecture. This subject plays a big part in the curriculum, taking up a bigger part than some practical subjects. For example, we studied two courses in the general History of Architecture, two courses in Islamic Architecture, two courses in the History and Theory of architecture. There are repetitive, long, and boring.

One factor in the low esteem in which history and theory courses are held is the fact that they deal with ancient or western, not Saudi, architecture. Speaking of his own studies the practitioner Rifai (interviewed 1998) states:

> The subjects of History and Theory were of no benefit to me personally, and they have nothing to do with practice. We did not study these subjects in terms of the relation of man to his environment, or of the philosophy of architecture, but in terms of what the Greeks did, what the Romans did, how certain churches were built, and so on.

Similarly the practitioner Nwaeser (interviewed 1998) has no time for architecture history: 'The History of Architecture was irrelevant. The emphasis was on studies of ancient temples and Egyptian pyramids, and to me it was just a waste of time.' In the same vein the student Zinaigeer (interviewed 1998) complains:

> Some of the subjects needed to be redesigned, for example the History and Theory of Architecture. There is no need for this subject; we studied Greek and Roman civilisation, and this is of no relevance to us.

However, the teacher Haikal (interviewed 1998) asserts the value of the history and theory curriculum areas:

> This is the area which receives the least adequate coverage in the curriculum, although it is supposed to be of the greatest importance, since this is where we can teach the student how to think. To be an architect you have to think right, and an architect should know about the social context of the environment and how it relates to his work.

And Haikal, in response to the researcher's remark that he had heard from a student that learning about Greek and Roman temples in History and Theory of Architecture was of little interest, is prompted to comment:

> Your question is directly related to History and how it is taught. Most History teachers teach it as a stylistic development of style over the years, without trying to explain the underlying ideas and principles behind the style. That is why the student cannot see the value of the course.

Moreover, the teacher Haikal feels that the main drawback in this area is the unavailability of standard texts in Arabic, which relates to remarks made by some respondents about being taught in English:

> There is no standard text book in Arabic for the student to read. . . The text books we are using now are in a language that the student cannot read and understand, and they lack the local perspective and are not relevant to the circumstances of the profession in Saudi Arabia.

The teacher Ustankok (interviewed 1998) tends to agree that it is the teaching of History and Theory courses which make them seem irrelevant:

> I am teaching History One, which is chronologically organised and has really no relevance other than to introduce the architectural principles that have been applied in the architecture of the past. I make a strong point of emphasising this to my students and I am sure that whoever has taken History One from me knows that this is the way to learn from history. I do not teach the style; that is an old-fashioned way of teaching history, which has been abandoned thirty or maybe forty years ago. What you teach in Architectural History is architecture itself. You are using history as a vehicle to give the students examples of how to make use of these principles. If an ancient Egyptian temple is a good example of axial planning, for instance, this is what should be emphasised, not the style of the columns etc. That is a by-product of the course.

Commenting on the role of the teacher the teacher Hariri (interviewed 1998) states:

> The preparation of the students is very weak on this subject [History and Theory] and sometimes the teachers and the students are not convinced of the importance of the subject. Sometimes the teacher is a non-Saudi and has a limited perspective of the cultural context within which Saudi architects have to operate, so that he cannot transmit it properly to the students. In the Saudi Omran Society we held a lecture about the future of Islamic architecture. It was supposed to be well attended by teachers and students, but very few people showed up. This will show you how unimportant in people's minds this topic is.

This pinpoints the fact that, as we have seen with Building Technology subjects, the familiarity of the teacher with his subject is of great importance. Non-Saudis find difficulty in understanding Saudi perspectives. There cannot but be a gap between education and practice if a teacher is distanced from the practical context of his subject.

The teacher Siddiqi (interviewed 1998) of KFUPM, a non-Saudi, knows this from personal experience:

> Where the Saudi faculty does not have the practical experience, at the same time the non-Saudi does have this background in practice, but they don't have the requisite background in culture and social issues. So they cannot understand the peculiarities of society as such. The result is that they end up teaching a lot to the student but the student is not able to deliver that in the field, because his knowledge and ability to comprehend things is out of the frame of practice in Saudi Arabia. That is the dilemma most students go through. My seventeen years' experience in the Kingdom has enabled me to adapt to this difficulty, although I can never act as a Saudi acts, having lived here for a long time, longer than anywhere

in the world. I have adapted to these trivial intricacies and deficiencies. So I tried to speak the cultural language of Saudi Arabia, the religious language, in order to come down to the level of the student, down to the social and cultural values, and then transfer and transmit the issues of design so that they can understand and grasp them. It is true that the teacher's ability and his personal background and personal experience in his field are definitely a valuable asset to him.

Not only in History and Theory of Architecture does the problem of relevance arise, but in other courses within this subject group such as landscape architecture, where students are taught about plants which do not grow in Saudi Arabia. Like western architecture history, this is imported to Saudi Arabia and has no application there.

There is in the researcher's field trip interviews a nice discussion during a group interview with some students of KSU, which neatly illustrates this point. It is here reproduced in full.

Zimindar (KSU):

> In Landscape, the teacher asked us to memorise different plant and tree names and some information about them for the examination. The exam was an oral one. The teacher showed the student photos with the slide projector and the student had to identify the name of the plants. The teacher, therefore, gave us the slides to prepare ourselves for the exam. The names were difficult. They were in English.

Musharif (KSU):

> These plants do not grow in Saudi Arabia.

Zimindar (KSU):

> Yes, so what we did is this. We tried to identify a landmark in the photo which was similar in pronunciation to the name of the plants, a sort of mnemonic device, such as distinctive car, or a passer-by, etc. We passed the exam, yes, but we have forgotten all about this subject now.

Jamaz (KSU):

> The teachers think that there is only one road to success, and that is listening to the teacher's lectures, writing them down, memorising the handouts, and then taking the written examination on this basis.

In the Social Studies and Humanities category we again see subjects the relevance of which is not always appreciated by students or indeed teachers. The reason for this is often that the subject content has little to do with actual practice in Saudi Arabia, or that the teacher is so distanced from the day-to-day realities of his subject area, whether through being non-Saudi or for the general reason that teachers cannot practise. Such distance from the world of the architecture profession inevitably means a gap between education and practice.

8.5 Project Preparation and Design

Courses that deal with the actual design activity both in its process and product make up this group. Knowledge and skill transference constantly takes place within it. It may be identified as a separate group coming after, and building upon, the basic graphic skills identified later within the Communications Group. In theory many writers and educators consider the contents of the first three groups as being inputs for the specific use of the processes within this group. Thus in theoretical terms this particular group becomes the core of the training of an architect and receives a reasonably large portion of his training time. Indeed the weight given to subjects in this group is even greater than is indicated by the number of credit hours, the contact hours being more than double the credit hours in all schools, in addition to the time that students spend on design subjects outside the school. Division of this group into subgroups will be as follows: Design Theory and Methodology, covering design processes and architectural programming; and the design studio, covering basic design, architectural design, urban/landscape design, multidisciplinary studios, and graduation projects.

Fig. 8.4 indicates the distribution of the credit hours and contact hours for the Project Preparation groups and subgroups at the Saudi architecture schools. It can be seen that the highest credit hour proportion for any one subject group is displayed for this group in the case of every architecture school except KFUPM. The relevant statistics are: KSU architectural design option, 54 credit hours (30.85% of the total), KSU building science option, 51 hours (29.14%) KFU, 60 hours (36.36%), KAU, 54 hours (32.72%), KFUPM, 43 hours (23.49%), and UQU, 57 hours (34.3%) . As far as credit hours are concerned KFU is the leader, but in terms of contact hours the top spot is taken by UQU. KFUPM, which does not introduce the design studio until the second semester of the second year and totals only seven design studio units in its programme as opposed to

10 in all the other schools, displays a lower credit hour proportion than the other schools.

All the schools apart from KFUPM and KAU show some credit hours devoted to Design Theory and Methodology courses. This is because these two schools do not treat design theory and methodology separately for syllabus purposes, but incorporate them within the design studio, which detracts in real terms from the credit hour time spent on design studio work in these schools.

Although the main emphasis of the design studio in all schools is the solving of design problems, each school devotes one of its design studio units to the integration of structural, mechanical, and construction systems into design. How successful this integration is can be assessed from our analysis of the interviews.

UQU devotes two of its design studios to its Professional Practice Unit, which is a simulated office environment. The first of these allows the students to meet with actual clients, discuss their requirements, and do the preliminary design accordingly. In the second they prepare the actual working drawing and present it to the client.

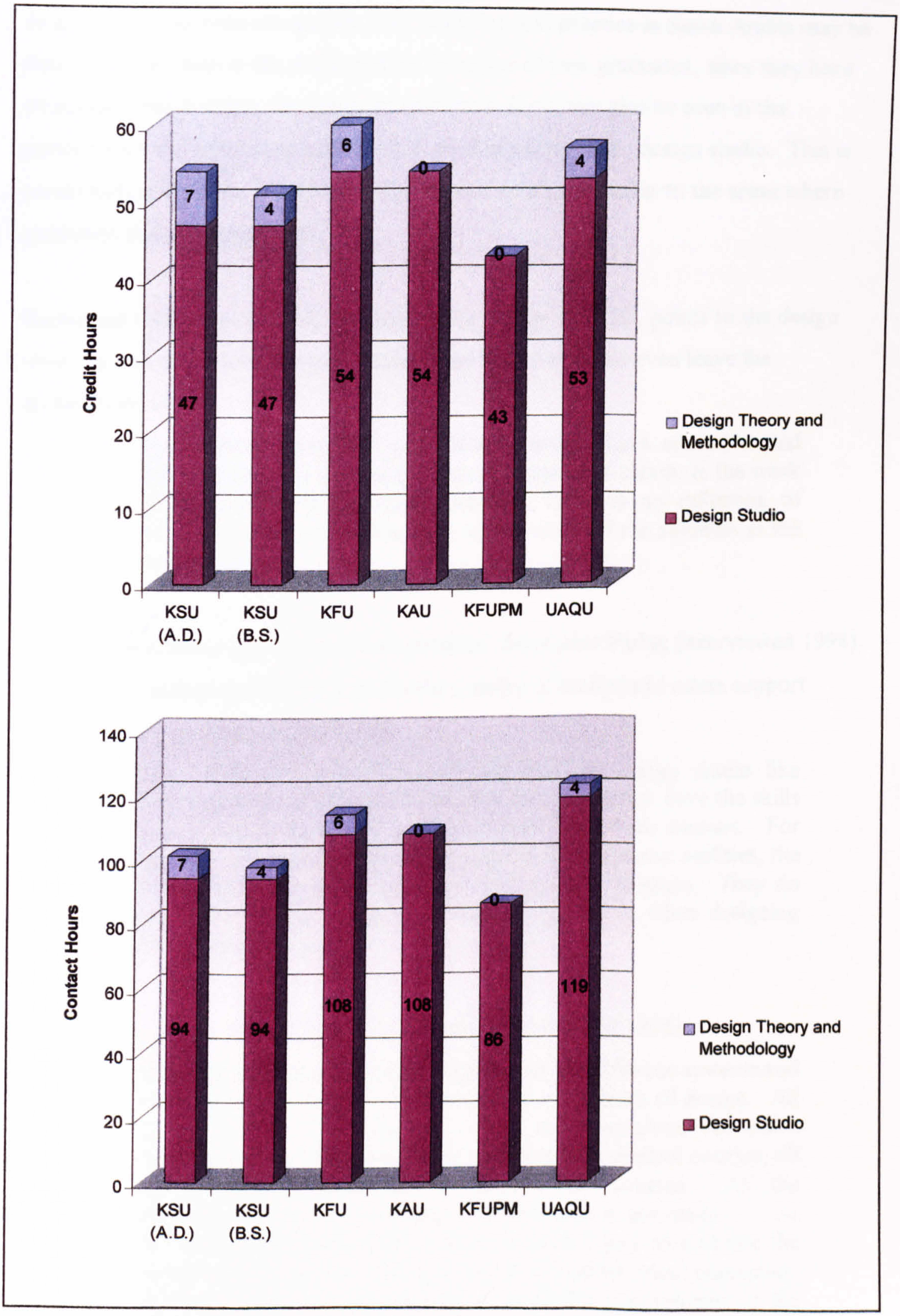


Fig. 8.4: Credit and contact hours distribution of Project Preparation and Design subgroups.

Although the gap between architectural education and practice in Saudi Arabia may be most obviously seen in the ability and performance of new graduates, since they have completed their training, the gap in an embryonic form may also be seen in the performance and competence of the students themselves in the design studio. This is particularly noticeable, of course, in those areas which are similar to the areas where graduates show inadequacies.

Barhamain (interviewed 1998), an architecture teacher at UQU, points to the design studio as one area where the gap is manifested before students even leave the architecture school:

> Yes, I think there is a gap between architectural education and practice, and you can see this gap manifest itself clearly in the work of the student in the design studio. There is no reflection of practical aspects of architecture on the work of the students in the design studio.

The training/practice gap has also been noted by the teacher Fadan (interviewed 1998), who echoes Barhamain's concern about the inability of students to relate support subjects to design studio performance:

> The individual subjects should feed into the design studio like rivers feed into a lake, but in fact the students do not have the skills to apply in the studio the knowledge they get in their courses. For instance, the students are unable to grasp the economic realities, the real costs, involved in the design projects they produce. They do not know how to design to a fixed budget, even when designing their graduation projects.

This is confirmed by the KFU teacher, Ustankok (interviewed 1998):

> They [the students] fail to put together all the different systems and information that have to contribute to the synthesis of design. All the ingredients of architecture are in the curriculum, the entire social and history courses, all the environmental control courses, all the structural courses, all the construction courses. All the ingredients of the soup are there, but the soup is not made. . . . At the end of the design studio work we have a jury to evaluate the success of the student. We find that it is a rather small percentage of the students who are responsive to all the requirements of the curriculum. You find nevertheless that students who are falling short in this still get to graduate one way or another, and bad buildings get built.

Ustankok also has this to say about the weakness of students in project preparation and design:

> I have the relative luxury of teaching the final year student. The reason I say the relative luxury is because I am able to expect my student at that level to have absorbed all the necessary parts of the curriculum relating to the technicalities of architecture. So the end projects that they do in the final year (9th, 10th) must reflect all these things that have been taught to them, and they should be able to give a good synthesis to all of this. Yet at the same time the structure is collapsing because the construction is not there. Environmental control, even the basis of it, is lacking, so it takes a lot of effort on our own part or that of whoever is teaching the final year studio to put everything back into their concept.

The KSU teacher Ghamadi (interviewed 1998) offers a stern critique of the quality of the students' project work in the curriculum:

> Most of the students spend their time designing floor plans, and trying to solve problems related to floor plans. They draw the elevation in the final week because it is a requirement. Often the appearance of a project at the floor plan level is very impressive, but what are missing are the practicalities of cost, structural requirements, and so on. In practice, however, these latter things make up about sixty percent of the work. A project might, therefore, seem worthy of an 'A' grade in school, but would only get an 'F' in practice! However, we don't see this reflected in the architecture curriculum.

There seems, from these remarks of Ghamadi and other teachers, to be a gap between what the student is taught in the support subject classes and what he produces in the design studio which parallels the gap that emerges later between the capabilities of the graduate and the demands of practice.

The prominent practitioner Aba-Al-Khail (interviewed 1998) asserts that his experience as a jury member indicates that shortcomings are found in students' design project work: 'During the jury meetings I look at the jury work, and I have to say unfortunately that the quality is rubbish.' When asked by the researcher why this is so he responds:

> There is a design concept, but this design concept is unbuildable, and if it is built, it will not be successful. Some essential needs are not fulfilled, such as the climatic, social, and structural requirements, the building laws and the safety regulations. All of these are not fulfilled. A good design does not mean a beautiful façade alone.

The comments that practical aspects are neglected in design projects echoes the remarks of many that new graduates take no account of the practicalities of architectural work, a clear manifestation of the education/ practice gap.

Typical of these comments made about new graduates is that of the practitioner Sedairi (interviewed 1998):

> While most of the graduates can do basic design their designs lack practical aspects. For example, they cannot design to budget, and they do not take into consideration climatic concerns. I mean such things as how much it is going to cost to air-condition a house or a building, and what we can do to minimise this cost by, for example, reducing the interior volumes, or minimising the use of glass, or by utilising shading devices, etc.

Sedairi is also critical of the design quality of the work of new graduates as well as their failure to take account of practical aspects:

> One more thing I would like to mention quickly which is a problem that we face here all the time. It is about the quality of design. Although the schools of architecture in Saudi Arabia emphasise design over other subjects, the graduate's works usually superficial at the level of concepts and theories. They usually try to satisfy the functional requirement of a building in their designs. But the overall design, the overall form and appearance of the building lack a philosophy and a concept. For example, they can provide in their works the right number of offices, the right number of lounges, of facilities and so on, but they place all of this in a box. I am talking here about the creativity in design that the new graduates lack. Some of the students try to be creative but the take the wrong path for that. They use in their designs bizarre forms and shapes such as circles, curves without an underlying ideas and concept. To remedy this, I think the students should be extensively exposed during their training to quality projects from all over the world. They should be taught the theories and concepts behind those quality projects. Books, slides, periodicals, and CD-ROM's should be available in the schools for the students to see and feel what a good concept in architecture is all about.

Also typical is the opinion of the practitioner Shoabi (interviewed 1998):

> There are shortcomings amongst the graduates in their approach to design. When I employ new graduates I usually give them just a small project to do, like a house. So when they start designing the house they begin with a basic shape, say an 'L' shape or a square with a courtyard inside, and then they attempt to adapt other things to this basic shape. However, the right approach to design is to try

> to understand the relationship of the building to its environment, and whatever shape develops from this approach will be the right shape.

Shoabi also points out that new graduates do not seem able to use reference material properly, something which goes back to their education and the lack of availability of resources combined with a failure of teachers to relate support subjects to the design studio:

> Also the graduates in their design do not take into consideration building and safety regulations, and the architectural details needed for their projects. Unfortunately not only do they not know how to do it, but they do not know how to get the information they need from references; they don't know how to get details, regulations, standards, etc., although we have all the material in our office. Information such as how many WCs you need for a building, how many fire escapes, are not guesswork but must be decided on study and understanding of the requirements.

Indeed the most commonly made comment on curriculum structure is that it is, in one way or another, not properly integrated, particularly, as we have seen in Section 8.3 above, between the design studio and other subjects. This is a major factor in the failure of students, and eventually graduates, to appreciate the practical realities of architectural work, and therefore in the gap between architectural education and practice.

12 of the 14 teachers who mention the curriculum make the point about lack of integration between support subjects and the design studio, although only two of the nine practitioners who mention it do so; this is only to be expected from architects who may in many cases be unfamiliar with curriculum detail since it is some time since they were students, and since some changes will often have taken place since their student days anyway. Lack of integration is remarked on by ten of the student respondents. A typical view is expressed by the architecture teacher Ghamadi (interviewed 1998), who specifically mentions the integration of various disciplines that is characteristic of practical architecture office work:

> Within the Department structural subjects are taught separately from mechanical, electrical, and building science subjects, so that they do not integrate holistically, and this has negative results. Similarly within the College, there are other fields such as Landscape Architecture, Town Planning, and so on, and within the wider University, there are disciplines which are relevant to

> architecture, such as Structural Engineering, Electrical Engineering, Mechanical Engineering, and so on. There is no co-operation between these various disciplines. . . . There should be a system whereby, at least for one project, students from these various disciplines should be brought together to work as a team so that they can see what the relationship is between their own subject and other disciplines, and would learn how to work together as a team.

It is worth noting that Ghamadi also points out that there is a lack of integration within the wider university, though such integration would benefit architecture students.

Haikal (interviewed 1998), another architecture teacher, comments on the lack of integration:

> The curriculum offers a group of courses on topics such as history and theory, building science, economics, professional practice, etc. It is supposed that these courses should feed into the design studio, which is for one reason or another a mission which is not accomplished.

One aspect noted by respondents of the lack of curriculum integration is the discontinuity and fragmentation that can be experienced. A topic that is explored in one year may not be useful to the student until much later in the course. Drawing attention to this in the curriculum structure the teacher Saleh (interviewed 1998) has this to say:

> They were taught the relevant information [on designing a multi-storey building] in the third year, and were given handouts. However, when they come to the Professional Practice Unit in the fifth year, all the information is gone and we have to re-educate them about it.

A student, Bugdadi (interviewed 1998), makes the same point about curriculum structure and integration:

> I would comment that there ought to be a rational sequence of subjects in the curriculum. There are subjects that need to come first, and some that need to be delayed until later. Other subjects need to be taught together in one semester.

A vivid example of what he sees as lack of curriculum integration is given by Ghanim (interviewed 1998), a student at KSU:

> I will give you one example to show you that there is no integration between the subjects of the curriculum and the design studio. I was supposed to study the mechanical course in the third year. However, I did it in the fourth year, the same year we did the System Design studio. In that particular studio we were suppose to do a design for a project and to do the working drawing and architectural details of the project, including the selection of the air-conditioning system. So I tried to apply the knowledge I was learning in the mechanical course, such as the selection of the air-conditioning units, the sizes of the ducts, the location of the openings, etc. The teacher of the design studio, however, asked me to do it in a different way.

Haikal (interviewed 1998), an architecture teacher in KSU, is quite clear about where he sees the problem lying in relation to curriculum integration. In response to the researcher's question about the integration of design and other subjects he indicates that there should be leadership from the top:

> I will be very candid and straightforward with you. We are supposed to look upon the School of Architectural Education as a school of thought that has a direction and a trend that it tries to follow. It is supposed, furthermore, that the person who manages this curriculum is like the coach of a football team or the conductor of an orchestra, and this manager should understand fully the process of education. So each teacher should work and co-operate with the other teachers as if they are in a team, and each member of the team has a role to play in reaching the objectives of the school. What is actually happening now is that each teacher is acting on his own in complete isolation from the others. No teacher can teach structure in isolation from what is going on in the design project. The head of the School, the Chairman of the Department of Architecture is the one who is supposed to lead the team and find the chemistry between the members of his team. Today the student cannot find a link between the different subjects of the curriculum and the design studio because the course content and the delivery of the courses by the teachers are not explicitly linked together. So on the one hand the teachers do not co-operate with each other, and on the other hand the Chairman does not have the ability to lead them. Curriculum management is really the problem.

While Haikal believes that the fragmentation of the curriculum is a result of lack of curriculum management, others attribute the cause to the introduction of a credit hour system. Barhamain (interviewed 1998) is one of the teachers who believe that the curriculum in theory is basically sound but that it has been spoiled by the system of credit hours:

> The theoretical framework of the curriculum in the Department of Islamic Architecture in Umm Al-Qura University is sound. There is however a deviation from the lines of the curriculum due to financial shortages and human resources . .. Also what has weakened our programme is that we are following the credit hour units that are not suitable for architectural education. Credit hour units tend to fragment the curriculum, so that, for example, Structure becomes a different subject, Building Science becomes a different subject, Design itself is treated as a separate subject, and they are not linked together.

Hariri (interviewed 1998), a teacher in the same architecture school, makes the same point when talking about the proposals in relation to the design of the Professional Practice part of the course:

> However, this was a proposal only on paper and has never materialised. There were many obstacles that stood in the way of this proposal. At the beginning the subjects within each unit were altered to a credit hour courses, so that Structure became a course by itself, Building Science became a course by itself, and so on, and there was no co-ordination between the subjects and the design studio. Also, there was not enough teaching staff to support the units. As for the proposed teaching office, there were financial and administrative obstacles that stood in the way of its creation.

Several interviewees think that the cause lies with the students and the way of thinking that they have developed from their pre-university education (See Chapter 6), where they tend to compartmentalise subjects i.e. they study and memorise them, take the exam, and then forget everything. They deal with each subject as a separate entity instead of attempting to integrate them.

A non-Saudi perspective is given by Hilton (interviewed 1998), an English architecture teacher in Saudi Arabia, who is also concerned about the lack of integration in the curriculum:

> They [the students] can reach a high standard during studio work, but again it is compartmentalised. You don't see the influence of this course in the design studio stage.

The KFU teacher Ustankok (interviewed 1998) believes that the problem of compartmentalisation lies with the students:

> My personal conclusion is that there is perhaps a cultural tendency to compartmentalise things. Like when you examine one of your

students in any one of these components of the curriculum they know everything. Like if you examine them on environmental control systems they know everything, but they do not know how to use the information. But maybe it is a cultural tendency to keep things in their proper pocket rather than mix them together and do something else with them. I am not saying that one hundred percent of the students are indifferent to these things. This is maybe due to their total indifference to the profession, because they found themselves in the schools studying architecture and don't care for architecture all that much. Some of the students are not cut out for architecture to start with. So they are not able to synthesise these things together.

Some of the students are very good students, who can recite things, memorise them and give them back to you in theoretical courses beautifully. But this is not the sort of attitude you expect from the students in the design studios. In the design studio you look for initiative from the students, you need inquisitiveness, you need efficiency. All these things are not part of the early training of students, who are basically much better at memorising. That makes them good engineers, I am sure. That makes them good medical professionals, I am sure. That makes them very good lawyers, I am sure. But those assets of the students are good in other fields of education, but not necessarily in the design studio, where a different type of mental activity is required. And I don't see any other way of producing a design project without the students synthesising all the information that is given to them in the curriculum.

That brings us back to the point that we mentioned earlier about the curriculum: it is all there, all the ingredients of the soup are there but the soup is not there, so where is the mistake? I think probably it is a number of things. There is not a single reason, and I am not someone who can give you all the reasons, but I am looking at architectural education from a limited perspective.

Others see the cause of the disintegration in the lack of co-operation between the departments, which is again something related to curriculum management. Lyali, an architecture teacher at KFU (interviewed 1998), laments the compartmentalisation of departments that took place in his school in 1989, leading to a loss of curriculum integration:

> Because there is no co-operation between the three departments we lost the interdisciplinary nature that our programme used to have.

Sa'ati, another teacher in KFU (interviewed 1998), makes the same point, linking it to shortage of staff:

> There should be a consultant of other specialities, such as Building Science and Construction, working together with the design studio instructor. We used to have this system. However, after the disintegration of the Department into different departments, we do not have enough teaching staff to support this idea.

But the teacher Lyali (interviewed 1998) from the same school as Ustankok (KFU) does not think that the students can be blamed for the lack of co-operation:

> Architectural technology is very important for the design to be successful, and it starts with the structure, with the mechanical services, etc. Although the students have studied all of these subjects, they don't apply them in their projects. And the students are not to blame, for they do not find the right consultation available in the design studio from the teachers of Building Technology.

Lyali points out that the reason for this lack of co-operation is systemic - namely that the departments themselves have become isolated from each other:

> The effect of this gap is that the student lacks architectural technology and architectural practice in his work. The reason for this is the lack of support from other departments in the College. The subjects are disassociated from the design studio. The students are taught Building Technology, for example, in the Building Technology department, but Design is taught in the Architecture department, so that what they learn is not related in any way to the work in the design studio and is not supportive of it. There is no backup from Building Technology teachers for architecture students, and no co-operation between the teachers of the one department and the other. The problem started after the divorce between the departments. The students in the past, before the divorce, produced a higher quality of project, because the different curriculum subjects were well linked with the design studio. In the studio there were teachers of Structure, Building Science, Construction, and Architecture. So the decisions that the students made in the design studio were made in consultation with the teachers. So they were like a committee or a team. Now the students take arbitrary and uninformed decisions.

A KFU student, Shrbini (interviewed 1998) speaks of 'no co-ordination between the studio and the subjects'. The student Johani (interviewed 1998) reports a similar experience from his architecture school (KAU) and pleads for more support subjects teachers in the design studio:

> We studied Structure, Construction, and Working Drawing courses, but there was no link between the three. There should be a Structure teacher in every design studio to follow up whatever we got from the three courses and make sure that we understand them and apply them in the design studio.

The student Assaf (interviewed 1998) (KSU) claims that there is contradictory information coming from different teachers, even if they do work in the design studio:

> We notice that there is a conflict in the opinions of the studio instructors. Each one of them gives you different concept of what is required. One instructor asks you to go in one direction and another asks you to go to the opposite one. There is an individuality and no co-ordination between the teachers.

A student from another school, Gazawi (interviewed 1998) (KAU), states in similar vein:

> In the design studio we feel shattered. Sometimes we have three or four design studio instructors. All of them emphasise the design concept, so that what one instructor sees as correct, the other sees as wrong, one as beautiful, the other as ugly. Sometimes we can't keep up with the changes of our design studio, especially under the pressure of getting low grades.

And Gazawi's colleague Kutbi (interviewed 1998) supports this:

> There ought to be co-ordination between the design studio instructors before they come to class. They should specialise. One should focus only on the design concept, another on Structure, other on Building Science, etc.

Because there is no integration between the design studio and the other subjects of the curriculum the projects in the design studio became unrealistic and distanced from what happens in practice. This is a matter of particular concern in view of the central importance that design has in architectural education.

The architecture schools, in Saudi Arabia as elsewhere, lay great emphasis on design, and from the structure of the architecture curriculum it appears that they operate under the supposition that the essential business of the architect is design. What is more, they have a particular concept of design. They assume that the process of design is basically about three-dimensional problem solving, and that the worth of the architect lies in his compositional skills, which can be gained and articulated through essentially non-practical expressions like drawing and model making.

Such a conception of the basic activity of the architect seems to imply that the architect is able to gain a real understanding of his product through abstract consideration alone, and is able through drawing to communicate that understanding to others. This approach to architecture seems to encourage the development of individual design talent that can only seek justification in terms of aesthetic merit and elegant problem-solving, because it fails to look for its justification in terms of practical applicability. Design, that is to say, has become an end in itself, and has lost touch with the building process. This means that, even if the work of the design studio were more fully integrated with the support subjects in schools, a gap between the concept of architecture in schools and the reality of architecture outside the schools would be bound to exist.

The practitioner Kurdi (interviewed 1998), a relatively recent graduate, recalls his university training, highlighting the gap between the project work that was required and the realities of practice:

> In the university the projects we do are unrealistic. Therefore they are irrational. We don't take into our consideration the requirements of the owner or the cost of the building. All that is emphasised in the design studio is the creativity of the student. I think there should be more emphasis on the use of different building materials and techniques, and there should be an emphasis on the general cost of the building. For example, when I graduated I didn't know about the building materials available in the market even the architectural materials, such as the different tiles I can use in the design and how much they cost.

And another recent graduate, the practitioner Ashi (interviewed 1998) highlights the primacy given to aesthetic over practical considerations in design studio project work:

> When I first started in the design studio the instructor asked me to start with a concept, like a 'C' shape or an 'L' shape, and try to fit the functions within the shape. However, after graduation and moving into practice I found that there were other constraints on design, such as the orientation of the building, building laws and regulations, and cost, etc. Although we studied all these subjects theoretically, they were not linked to the design studio. The

> outcome of design studio work in the school depended on how beautiful the building was, and that depended on the taste of the instructor.

This emphasis in Saudi architecture school curricula on design as *the* activity of the architect is commented on by several interview respondents. The practitioner Fayez (interviewed 1998) comments on the students who come to work for his firm as new graduates:

> The student is somewhat prepared in the design aspects, but he does not have a full understanding of the comprehensiveness of architectural work. After the student graduates and comes to work in my office he thinks that architectural world is the product of a good concept in design, but he does not know what goes on after the design concept stage. The student's design concepts lack the practicalities of architectural work. This is what I notice from the students who come for their summer training in my office. (I take about twenty to thirty students a year.)

In response to another question Fayez also says:

> The problem is that the emphasis of architectural education in universities is always on design. So the graduates think that they will work mainly as designers when they graduate. However, in practice conceptualisation and design constitute about eight percent of the work of a project. The rest goes toward documentation, working drawing, structure, architectural details, site supervision, and project administration. So the student, after he graduates, receives a shock because he was prepared for design and not for the other aspects of the work.
>
> For those students who do not have the talent even for design, when they graduate they graduate with nothing to offer at all at first. Some of the students who come and work for me, who don't have natural talent for design, sometimes have the leadership skills for project administration, for example, which has lain hidden because all the time the schools were emphasising design. Other students have again a hidden natural talent for working drawing, architectural details, etc. Some of the architects have the talent for architectural presentation rather than design, and this is all that they do in my firm. Indeed there is a gap between architectural education and practice, and I think the school should address the other aspects of architectural practice.

Some teachers, too, feel that there is too much emphasis on design in the curriculum. The UQU teacher Barhamain (interviewed 1998) states:

> As I told you the schools lay great emphasis on design. If a student is a good designer he is a good student; if he is a bad designer, then he is a bad student. And by design, they normally mean whether the floor plan works and what the form of the building is. But in reality an architect is much more than a designer. He also has to be an administrator, a site manager, a communicator, and so on. The schools of architecture should also teach the students about these aspects of an architect's work.

Saleh, also a UQU teacher (interviewed 1998), acknowledges:

> In the design studio there is an emphasis on the formal aspects of design at the expense of the supporting subjects, so that the students gradually become more convinced that these subjects are inferior to the design studio and of no importance whatever. Because of the time that the students spend on design, they have no time to study these supporting subjects.

Another teacher, Mohammed-Ali (interviewed 1998) (KAU), also believes that there is too much emphasis on design, in view of what many architecture graduates will actually do. He speaks of the gap between education and practice in these terms:

> It is the gap between what we are educating our students for and what they work as after they graduate. We educate our students to be designers, mainly. However, though in practice some of our graduates do work in design, some of them also work as, for example, building contractors.

This view is supported by Tarim (KAU) (interviewed 1998), another architecture teacher:

> The School, in preparing its students, emphasises the role of the architect as a designer. In practice professionals who work as designers are few; the majority work in different domains, such as government agencies or in building maintenance.

The practitioner Bagabas (interviewed 1998) also feels that design has been emphasised too much: 'The school has prepared us only for design, but nothing beyond that.' Another practitioner, Kamfer (interviewed 1998), claims: 'Unfortunately the schools prepare the students for the task of design only.' Rifai, a practitioner (interviewed 1998), comments: 'They [the schools] prepare the student to work on the design phase of a project, but not on the supervision or the construction phase.'

There is also some support for the view that there is too much emphasis on design from the student Bugdadi (interviewed 1998), who says: 'The School's emphasis is on design only, but in practice the architect does design and other things.'

As a result of too much emphasis on abstract design project work takes on a repetitive nature. For example the practitioner Ashi (interviewed 1998) states:

> All the design studios I have been through are basically repetitions with different project names. Only the shape and the form of the building was what was emphasised, and what was discussed with the juries. Other technical aspects were not introduced in the design studios, such as building science, architectural details and specification, structure, etc.

The practitioner Kamfer (interviewed 1998) also stresses the repetitiveness of projects as well as the gulf between the project work students do and the realities of architectural practice:

> There needs to be a variety of projects offered in the design studio. What is offered now in the design studio is one type of project, which is the monumental or stylistic building. In practice, however, architects rarely get this kind of project to do, especially at the beginning of their careers. They need to introduce more practical subjects, such as housing units for limited income people, or multi-purpose apartment complexes in expensive areas where the income generated is very important, or design in historical areas.

The KFUPM student Shrbini (interviewed 1998) emphasises how repetitive design projects often are:

> A further point is that the projects offered in the design studio are all similar and repetitive. The only difference is the name of the project. We need new types of project that are linked with the real needs of society. Also the requirement of the final submission is the same for the junior and the senior students. They are all plans, sections, elevations, models, and perspective. As we progress from junior to senior we need more information to be applied, such as architectural details, architectural drawings, cost analysis, etc.

Even the teacher Lyali (interviewed 1998) is ready to acknowledge this point and points out that new themes in the graduation project have been introduced in the school (KFU) of which he is Vice-Dean:

> And speaking of graduation projects, we find that all the graduation projects are repetitions of each other. The themes are repetitive and uninspired. The students choose mostly to make a design of a monumental building such as a government building, corporate headquarters, etc. So we have decided that each graduation project should have an emphasis either on building conservation, energy conservation, or urban design.

Another consequence of the focus on design is that it stresses individuality over teamwork, something remarked upon by several interviewees. The KSU teacher Ghamadi (interviewed 1998) is concerned about this:

> Within the School there is an emphasis on individuality; each student works on his own on his project throughout the period of his training. However, architectural practice is by nature a matter of teamwork. Within the Department, within the College, and indeed within the University as a whole there is a lack of awareness that professionals from various disciplines must work as a team.

Kurdi (interviewed 1998), an architecture practitioner, is also keen to see more teamwork. He feels it would prepare new graduates for the way things actually happen in practice:

> The graduation project, I think, should be a multidisciplinary project between architects and structural, electrical, and mechanical engineers, and so on. In the universities, there is an emphasis on the work of the individual, but in reality the work is produced by a team. So after he graduates the student finds it hard to work in a team.

And Fayez (interviewed 1998), also a practitioner, emphasises that projects are in professional practice produced by a team, unlike the individual design project of students:

> One thing I would like to add. In schools of architecture, there is an emphasis on individuality rather than on teamwork. Nowadays in practice, a team of architects and engineers produces the project, and not an individual person.

The teacher Saleh (interviewed 1998) also comments on the need for the curriculum to place more emphasis on teamwork:

> Yes, there is a gap, and this gap could be attributed to many causes, basically that the schools do not reflect the nature of architectural practice. In the past the architect was the leader of the building

> team, but now he is just a member of the team. Architectural education in Saudi Arabia trains the student for the former. The emphasis is always on the work of the individual and the education is not organised to allow the student to work in a team. Architectural practice is in reality a collaboration of many different specialists. In practice the architects work with urban planners, with landscape architects, and with other professional specialists like mechanical engineers, structural engineers, etc. The schools of architecture do not allow the students to work together in projects.

Masoud, a practitioner (interviewed 1998), also stresses teamwork, implying that it is not given enough attention in the architecture schools' curricula:

> Very few graduates know how to work as a team member, how to respect senior architects, or how to make a junior architect work and tackle his problems. Some of the students are good architects but they don't know how to work with other architects.

The practitioner Attas (interviewed 1998) remarks:

> Graduates also lack understanding of the relationship of architecture to other disciplines, such as civil engineering, electrical and mechanical engineering, etc.

As with other subject areas in the curriculum, some interviewees relate the particular emphasis on design, and especially the theoretical aspects of it, to the fact that teachers are out of contact with practice. The KFU student Ajmi (interviewed 1998) says: 'Most of our teachers don't practise architecture. That is why they always emphasise the appearance or beauty of the building. They also emphasise how the floor plan functions.' The practitioner Rifai (interviewed 1998) suggests in relation to the education/practice gap:

> I think the reason for this gap is that most of the teaching staff do not practise architecture. They emphasise only theoretical and philosophical aspects of design, and when their students graduate they find themselves speaking a different language from those with whom they have to deal professionally.

The practitioner Nwaeser (interviewed 1998) recalls the difference working with a teacher with practical experience made:

> I remember that when I was a student I studied in the design studio with a professor who used to be the Director of the Administration of Building Construction in the Ministry of Interior. And we were

> really happy and comfortable working under his supervision because his practical experience was reflected in his teaching. We felt as though we were working in a real office.

The teacher Haikal (interviewed 1998) (KSU) has no doubt about one of the causes of the gap between education and practice in Saudi Arabia. He states: 'This gap has been widened because in Saudi Arabia teachers do not practise and practitioners do not teach.' And, at greater length, he comments on the manifestation of the gap when practitioners visit the design studio as jury members:

> The relationship between architectural education and practice in Saudi Arabia is almost non-existent. In our School the only element of co-operation between training and practice is that we invite architecture practitioners to be members of the juries which assess students' final projects. We can see the differences between the approaches of teachers and practitioners when these juries discuss the projects with the students. The teachers talk about the philosophy, the theory, the form, the concept, the symbol, etc. of the designs, whereas the practitioners speak about the practicalities, such as building laws, costs, structure, and so on. So the student comes into contact with practitioners only on such occasions, which are three times in a semester, three hours each jury, a total of nine hours. The rest of the semester students spend only with teachers, who are by law cannot practise architecture.

It seems quite clear from the analysis of the Project Preparation and Design subject area in architecture school curricula that there is a wide gap both within the curriculum structures, in that design projects proceed without being fully integrated with other curriculum subjects, and between the work students do for their design projects and the work they will do in architectural practice. Respondents relate the gap between the curriculum and practice to the fact that there is no integration between the design studio and support subjects within the schools. This, in turn, is felt to be due to lack of curriculum management, to the credit hour system, to lack of co-operation from support subject teachers, and to the compartmentalised mentality of the students. Because there is no integration the projects ignore the potential for teamwork, become unrealistic, focusing on three dimensional stylistic composition, and become repetitions of each other.

Respondents also relate the gap to the fact that teachers are themselves distanced from practice (not being permitted to practise), and to the fact that there is an over-emphasis on the theoretical and aesthetic aspects of design at the expense of a concern with the real end product of design - the building - which is the actual concern of architectural practice.

8.6 Communication

Subjects dealing with 'drawn' as well as 'verbal' and 'written' means of communication in developing and presenting conceptual as well as instructive decisions in the process and practice of environmental design are in this group. In addition to the transference of knowledge specific skills are learnt and later articulated in order to maximise the process of communication.

Fig. 8.5 indicates the distribution of the credit hours and contact hours for the Communication groups and subgroups at the Saudi architecture schools. It can be seen that this subject group is divided into the following subgroups: Presentation Techniques, covering basic drawing, free hand drawings, architectural graphics, modelling, and computer aided design (CAD); Written and Oral Languages, covering both Arabic and English.

The first school of architecture to introduce CAD was the School of Architecture in UQU in 1986. Two years later in 1988 the Schools of Architecture in KSU and KFU started their CAD courses. KFU was the first university to introduce computers into the curriculum. However, the course was geared towards computer languages rather than architecture-oriented computer courses.

Until recently the English Language has been the only medium of instruction in Saudi Arabia medical and engineering schools (including schools of architecture). The reasons for this are that the first architecture teachers in the Kingdom were primarily from English-speaking countries, and the majority of text books and periodicals on architecture are in English. Though Arabic has now replaced English as the main instruction language in Saudi architecture schools, instruction in English Language is still a feature in all architecture schools, and there are still some schools where some of the teachers instruct in English.

The credit hour statistics for this group are: KSU, 25 credit hours (14.28% of the total); KFU, 7 credit hours (4.24%); KAU, 25 hours (15.15%); KFUPM, 46 hours (27.87%); and UQU 18 hours (10.77%). From Fig. 8.5 we can clearly see that KFUPM has the highest proportion of credit hours in this group, both in the presentation technique and written and oral subgroups. Indeed, the proportion is higher than it is for the project preparation and design group. This is partly because at KFUPM there is an element of compensation in this group for the smaller number of credit hours devoted to design studio units in the project preparation and design group, and partly because at this university the language of instruction is still primarily English, so that much time has to be given to learning the language. KAU, while devoting fewer credit hours to this group than KFUPM, nevertheless also shows a higher proportion than most other schools, again compensating for the smaller number of credit hours devoted to the project preparation and design group. The lowest number of credit hours in this group belongs to KFU, in the case of the written and oral subgroup only three hours. However, when the total contact hours (26) for this subgroup are considered, KFU is seen to offer students more in this respect.

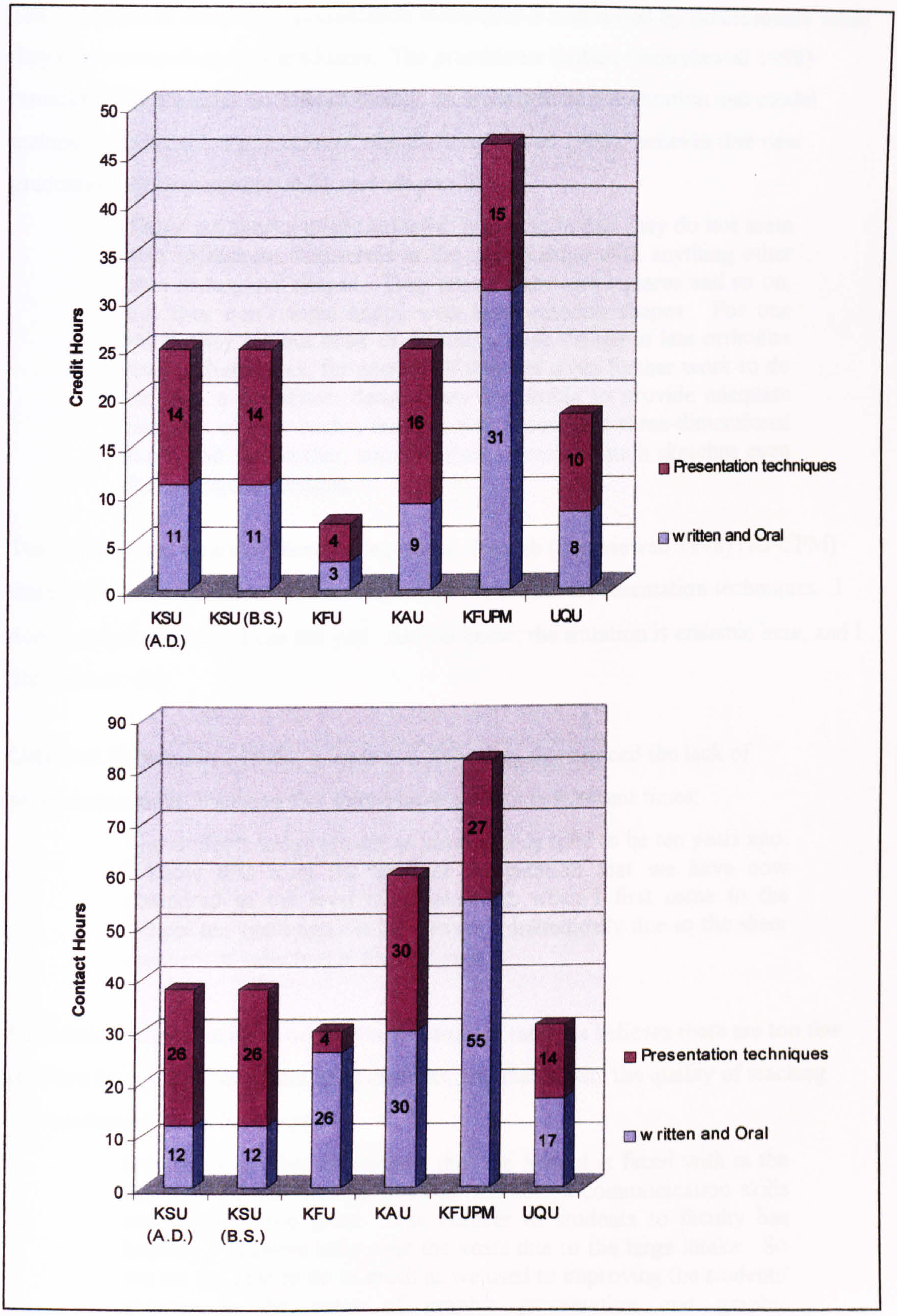


Fig. 8.5: Credit and contact hours distribution of Communication subgroups.

The weakness of students in presentation techniques is well noted by practitioners when they come to work as new graduates. The practitioner Sedairi (interviewed 1998) remarks: 'The students have shortcomings on architectural presentation and model making.' And another practitioner, Shoabi (interviewed 1998), believes that new graduates lack presentation skills and adaptability:

> There are shortcomings amongst graduates in that they do not seem able to express themselves at the design stage with anything other than orthogonal shapes. They are all right with squares and so on, but they don't seem happy with less orthodox shapes. For one thing, they seldom think of making a basic design in less orthodox shapes themselves; for another, if they are given further work to do on, say, a curvilinear design, they are unable to provide adequate sketches of how such a building will appear in a three-dimensional form; and for another, some of them cannot do such sketches even for orthogonal designs.

Teachers too are aware of these inadequacies. Rageeb (interviewed 1998) (KFUPM) states: 'Our students have weaknesses in their architectural presentation techniques. I don't know what more I can tell you. As you know, the situation is endemic here, and I don't know why.'

Ustankok (interviewed 1998), a teacher at KFU, has also noticed the lack of presentation skills, believing that things have got worse in recent times:

> The students today are not as good as they used to be ten years ago. I know that from the level of presentation that we have now compared to the level of presentation when I first came to the School ten years ago. It has dropped dramatically due to the sheer numbers of inductees in the first year.

Ustankok further comments on the teacher/student ratio; he believes there are too few teachers for the number of incoming students, and that is why the quality of teaching communication skills has dropped:

> I think the number of students that the School is faced with in the first year of this College when all the design communication skills are taught is too great. The number of students to faculty has become a negative ratio over the years due to the large intake. So we are not able to do as much as we used to improving the students' abilities in the areas of graphic presentation and graphic communication etc.

Ustankok explains that this problem is not peculiar to presentation techniques only but extends to include other media of communication:

> The same thing may be concluded about English. English teaching is the same, but the numbers are different now. This theory applies to every level of teaching; the teaching quality is the same but the number does not allow the quality to be absorbed by each individual student any more, because there are more students to cope with.

Like Ustankok Haikal (interviewed 1998), who teaches at KSU, relates weaknesses in presentation skills to general communication failure amongst the students. He exempts the students themselves from blame, stating that it is the system that is at fault:

> Why don't we teach our students report-writing skills? I always ask my students to write a two-page report about their final project, but unfortunately they cannot do this. It is not their fault; it is the fault of the system.

Haikal is saying that what really needs to be understood are the needs of Saudi architectural practice before remedies can be identified and put in place:

> The main question is, what are the basic requirements which a student needs in his future career? Are they the freehand skills and the technical drawing skills which we are teaching him now, or could it possibly be something else? I don't know the answer, but what I am sure of is that we need to forget the Beaux Art, to forget the Bauhaus, and start from here.

The remark of the KSU teacher Fadan (interviewed 1998) indicates that he is aware of the students' inability to communicate well. He clearly believes the school needs to provide some input in this area:

> Unfortunately we do not place any emphasis on training the student to present his work orally to a potential client. The failure to do this properly can be seen when students present their projects to the jury for assessment. Many students are concerned to show that their work is the best, or indeed the only possible, solution to the problem. In practice, however, an architect has to be less defensive in the real world, and more concerned with selling his services persuasively to potential clients.

General inability to communicate, as well as the more technical matter of lacking architectural presentation skills, are clearly major handicaps to the student when he graduates and enters the architecture profession. They are yet a further manifestation of the gulf between what the students are taught at architecture school and what they require for architectural practice.

8.7 Professional Practice and Management

This group includes two subgroups: Construction Documentation, covering working drawing, specification, and quantity surveying; Professional Practice, covering ethics, project process, laws and regulations, building economics, and building and business management.

Fig. 8.6 indicates that the statistics for this subject group are: KSU, 8 credit hours (4.5% of the total); KFU, 9 hours (5.45%); KAU, 13 hours (7.87%); KFUPM, 8 hours (4.37%); and UQU, 4 hours (2.39%). The school at KAU displays the highest number of hours, part of the reason for this being that this school is the only school that does not devote a design studio unit to working drawing. To compensate for that it offers two working drawing courses totalling 8 credit hours. The actual contact hours are 14. In this course the students are required to produce working drawings from one of their previous design studio projects. The lowest statistics belong to UQU; this a direct result of the provision of the Professional Practice Unit, where students are exposed to professional practice problems in a simulated office.

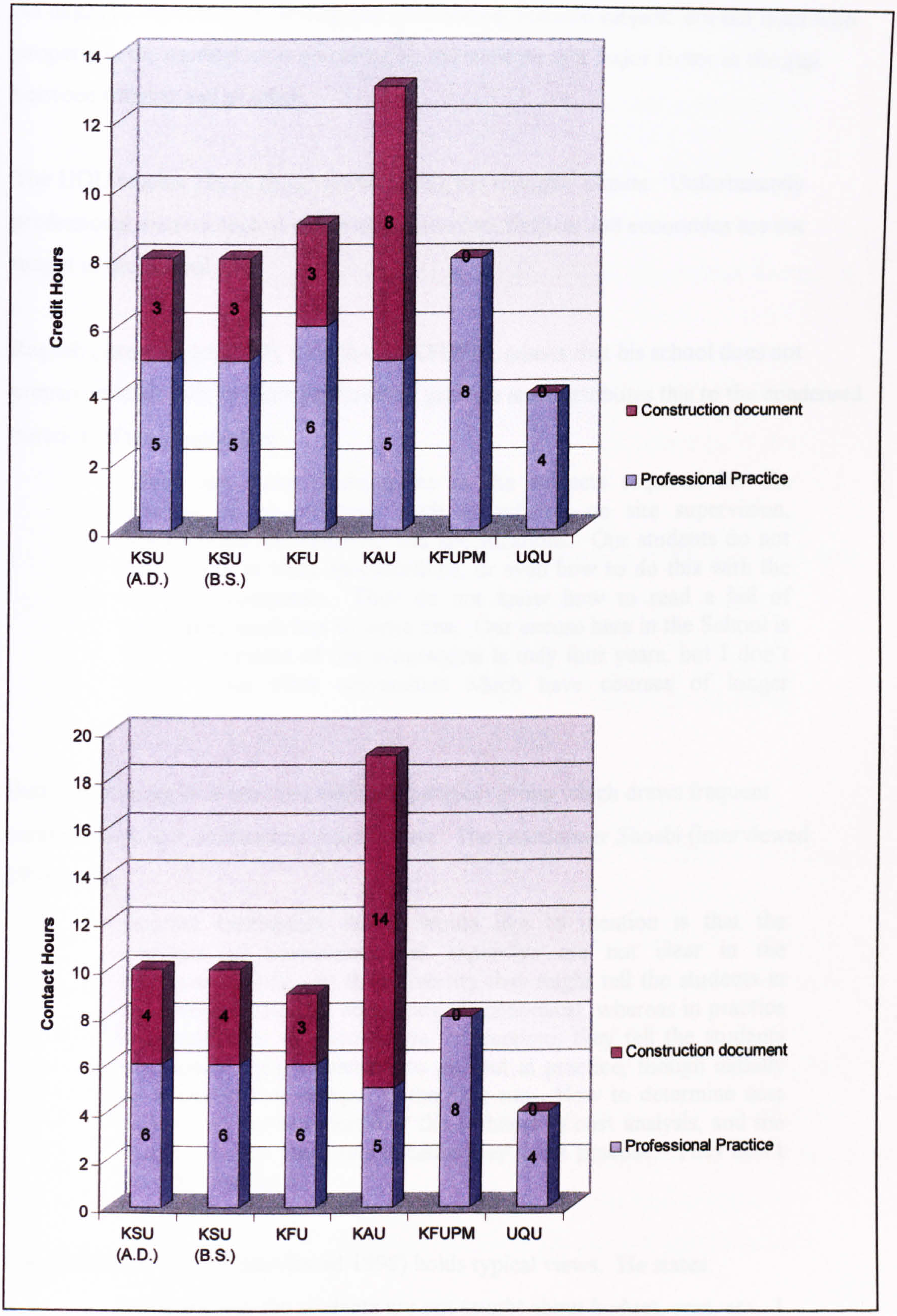


Fig. 8.6: Credit and contact hours distribution of Professional Practice and Management subgroups.

As might be expected, the feeling that professional practice subjects are not dealt with properly in the curriculum is perceived by respondents as a major factor in the gap between training and practice.

The UQU teacher Hariri (interviewed 1998), for example, admits: 'Unfortunately professional matters such as office administration, finance, and economics are not taught in the School.'

Rageeb (interviewed 1998), a teacher at KFUPM, admits that his school does not prepare student fully in some professional practice areas attributes this to the condensed duration of the programme:

> There are some inadequacies in the subjects required for the training of an architect, such as subjects on site supervision, construction management, and specifications. Our students do not know how to write specifications, or even how to do this with the aid of a computer. They do not know how to read a bill of quantities, much less to write one. Our excuse here in the School is that the duration of our programme is only four years, but I don't know about other universities which have courses of longer duration.

Building economics is one area within this subject group which draws frequent comment amongst architecture practitioners. The practitioner Shoabi (interviewed 1998) says:

> Another inadequacy that I would like to mention is that the concepts of economical and expensive are not clear in the graduates' minds. In the university they might tell the students in the design studio that something is economical, whereas in practice it is expensive, and vice versa. Sometimes they tell the students that something is expensive to do, but in practice, though initially more costly, it is cheaper in the long run. How to determine cost depends on the experience of the architect in cost analysis, and the teachers cannot teach this because they don't practise. They don't have this feel for it.

The practitioner Attas (interviewed 1998) holds typical views. He states:

> In the schools the students are not taught about budget, cost, etc. I think the imagination of the student in the school is allowed free rein. But in practice there are constraints, such as budgets, regulations, client needs, etc.

Emphasising the importance of building economics in architecture work another practitioner, Fayez (interviewed 1998) says:

> The other criteria that should be taught to the student are to design to budget, deliver it on time, and build it without errors, delays, and mistakes. The most important things for clients are firstly the budget, then time, and then mistakes.

Kamfer (interviewed 1998), an architecture practitioner, also comments on the lack of financial content in the curriculum:

> In building economics the student needs to know about feasibility studies, cost analysis, etc. He needs to know approximately how much a building will cost. He needs to know how to make a building less expensive. And unfortunately in the school he is not exposed to these issues.

The practitioner Kurdi (interviewed 1998), a relatively recent graduate, points out that building cost awareness was not part of the curriculum when he was a student:

> We don't take into our consideration the requirements of the owner or the cost of the building. All that is emphasised in the design studio is the creativity of the student. . . . There should be an emphasis on the general cost of the building.

Students too are aware that they suffer in practice through the curriculum being deficient in content on practical, particularly financial, matters. On building economics concerns Gadair (interviewed 1998) (KSU) remarks: 'We don't take into our consideration when we design the project how much it is going to cost or whether it is a feasible proposal.' The student Zinaigeer (interviewed 1998) (KFU) states: 'We have not been taught how the budget influences design.' And this is echoed by the student Hindi (interviewed 1998) (KFUPM): 'On the cost of a project and the design to a fixed budget, our preparation was very weak. We lack the practical awareness of it that is relevant to the market in Saudi Arabia.' In response to the researcher's question about whether costs and designing to budget are in the curriculum the student Hilmi (interviewed 1998) (KAU), linking his criticism to the gap between education and practice, responds:

> We haven't studied it at all. Here in the School we study ideal projects with no link to the real world. We don't take into consideration the calculation of the cost of the building or a budget that we have to design to. We also don't consider that the client

> has a specific need and budget and that we must design accordingly. I have a project, which is the development of a street. In the School it is okay to knock down any building that gets in the way of my design plans. In the real world it is not as simple as this. When we graduate we will meet with different clients with different needs and every one of them has his own budget and requirements. These need to be fulfilled.

Some teachers, too, are prepared to recognise that the curriculum in schools of architecture does not deal properly with financial skills. Fadan (interviewed 1998) (KSU) admits frankly that financial matters are not taught to students. He says unambiguously: 'The students are unable to grasp the economic realities, the real costs, involved in the design projects they produce. They do not know how to design to a fixed budget.' And Ghamadi, from the same school, (interviewed 1998) also shows he is aware of this, connecting the lack of financial content in the curriculum with the practical realities of structural needs:

> What are missing are the practicalities of cost, structural requirements, and so on. In practice, however, these latter things make up about sixty percent of the work. A project might, therefore, seem worthy of an 'A' grade in school, but would only get an 'F' in practice! However, we don't see this reflected in the architecture curriculum.

A KFUPM teacher, Rageeb (interviewed 1998), also notes that the curriculum does not cover budgeting: 'Our students do not take into consideration economic factors. The teachers think that considering building costs will limit the students' imagination.'

Another area of professional practice felt to be neglected in the curriculum, with obvious consequences for new architecture graduates in practice is building laws and regulations. The KFU student Atiah (interviewed 1998) observes: 'The Saudi building laws and regulations, as required by municipalities, are not covered anywhere in the curriculum.' This is confirmed by the KFUPM student Niazi (interviewed 1998): 'Teachers are not aware of building laws and safety regulations in Saudi Arabia.'

Practitioners, too, find that these things have been neglected in the architecture school curriculum. Attas (interviewed 1998) states: 'Building laws and the regulations of the municipality are not taught in the schools.'

There is some recognition amongst teachers that this is an area where the curriculum is lacking. The architecture teacher Akbar, Chairman of the Department of Architecture at KFU, (interviewed 1998) says:

> After the student graduates he has to deal with building laws and regulations of the municipality. He has to deal with laws concerning electricity, water, and sewage. He has to deal with fire and safety regulations, etc. In the school the student is not exposed to these matters.

One teacher, Haikal (interviewed 1998) (KSU), while confirming that this is an area of deficiency in the curriculum, excuses this on the basis that the laws and regulations are practically useless:

> I will tell you what I think, and I am sure this is the opinion of other teachers. Frankly, we don't trust these codes and regulations, and we are not convinced that they are correct. So we do not like to teach them as a constraint on design. In fact these codes and regulations are superficial. There isn't much to teach anyway. There is no building law other than height and setback regulations, which have had a negative impact on the built environment.

Working drawings, architectural details, and specification are other areas where many feel that there are curriculum shortcomings, if not downright omissions, which manifest themselves in the training/practice gap when graduates move into office work. They will be dealt with together because of their close relationship and because so many respondents mention them in the same breath.

The practitioner Bagabas (interviewed 1998) echoes the complaint of many students that teaching methods were too theoretical in this subject area:

> Another example is the working drawing. Architects in practice need to know how to read working drawings. In the School we were taught this again theoretically. We were taught what working drawing was all about, what its use was, etc. But I never saw an actual working drawing until after I graduated.

The practitioner Qurashi (interviewed 1998) believes that graduates are weak in this subject area because the teaching is too theoretical, a criticism that we have also met in relation to other subject categories:

> Also all of the graduates lack the technical understanding of architecture. I think the schools here teach them something about specifications, but all their studies are theoretical; they don't know how to apply their knowledge in practice. Go and ask any graduate to write a primary four-page specifications for a house, and I bet you he can't do it. He can't specify the doors, the windows, etc. After he starts work he has to go through a learning process in order to know how to do that.

It is amongst practitioners, indeed, that perceptions of curriculum shortcomings in these areas are most keenly felt. We have already noted what many of them have to say about the inadequate knowledge of new graduates. Ashi (interviewed 1998) states:

> After I graduated and started to work in practice I found that I was underprepared in architectural details and specifications and knowledge about the available building material in the market. After I finish the design I usually meet with clients and they ask me about details such as whether the materials are available in the market or whether they need to be imported, and how much it is going to cost them. And sometimes I am confronted with technical questions about, perhaps, central air-conditioning, to which I do not know the answers.

The practitioner Sedairi (interviewed 1998) comments on the matters which he feels have not been taught to new graduates. Speaking of new graduates in his office he comments:

> I can also tell you that most of the graduates, if not all of them, are unable to do working drawing, they know nothing about architectural details and specification, and they are completely in the dark about the notion of bills of quantities.

The practitioner Fayez (interviewed 1998) also believes that there is a training deficiency in this area:

> The graduates are deficient in working drawing. Not only do they not know how to do it, but what the concept of the working drawing is all about, what to put into it and the hierarchy of the working drawing from the site plan to the details. So we have to re-educate the graduate in this matter.

Another practitioner Kamel (interviewed 1998) believes that there has been insufficient curriculum time devoted to detailing: 'From my experience with students I find them underprepared in terms of architectural details.'

And this weakness is also mentioned by the teacher Mufti (interviewed 1998) (KAU); of their design studio work he says: 'At the conceptual level it is good, but in the architectural details and technicalities it is not.'

The teacher Hariri (interviewed 1998) (UQU) gives an example which he believes illustrates that students can sometimes reproduce but not understand what they are taught in this subject area. He relates this to the credit hour system and to the lack of integration in the curriculum:

> Let me give you an example. I was once on a jury and the student drew a cross-section in a building, with all the details, and when I asked him about those details he had just drawn he told me he had copied them from an construction text book in order to satisfy the requirement. So sometimes the students produce the correct detailed drawings, but do not know how the process is actually carried out in practice, since they have simply copied them. The credit hour courses motivate the student only to pass the course exam; these courses have fragmented the holistic approach to architectural education into separate courses with no apparent connection between them. The student does not know where each course fits into the larger picture

Lyali (interviewed 1998) (KFU) admits that the teaching of these subjects is deficient in his school:

> Another point I would like to make about the effect of this gap on the student is about working drawing and architectural details. Working drawing is taught in this school in one course only. Students do some architectural details in their graduation projects but the overall quality of the work is very poor.

Another KFU teacher Sa'ati (interviewed 1998) agrees: 'Unfortunately it is not covered well enough. The student during his course of study at our school does only one or two sheets at the most of working drawing.'

Although it is not his field, the teacher Fadan (interviewed 1998) thinks the same is true in his school (KSU):

> I don't teach this subject, but as far as I know the training the students receive in this is not enough, and there ought to be an emphasis on this subject because it is an important aspect of an architect's work.

The teacher Tarim (interviewed 1998) is also aware that the curriculum in his architecture school, KAU, does not deal fully with this:

> There are some aspects that are not fully covered in the School, such as working drawing, architectural detailing, and specification. We have a course on working drawing, for example, but naturally we cannot put too much emphasis on this at the expense of other subjects.

Tarim, however, is not convinced that teaching such subjects in depth is the job of an architecture school. He goes on to say in this context: 'I think the role of a university is to give you a synopsis of each subject, and then the student after he graduates should build on this basis.'

Students are also aware of the curriculum deficiency in this area. Asked about working drawing in the curriculum the student Jaroof (interviewed 1998) (KFUPM) comments:

> Not enough. There was only one course and there were no back-up site visits. The subject isn't given due importance. The architectural work is mostly details, and we cannot do architectural details.

The KAU student Bugdadi (interviewed 1998) feels the same:

> We took only one course on Working Drawing, and in fact it is not enough. I feel that we have some shortcomings in this subject, especially in architectural details and specifications.

His fellow-student Kutbi (interviewed 1998) claims that subjects in this group were not linked to the design studio: 'In the studio we are always asked to produce floor plans and elevations, not working drawings or architectural details or specifications.'

Ajmi (interviewed 1998), a student at KFU, found the curriculum inadequate in detailing:

> Sometimes the instructor in the design studio asked us to provide some architectural details, but we copied them from graphic standards books just before our final presentation.

Atiah, also a KFU student (interviewed 1998), is of the opinion that better teaching in this subject area would help:

> Education needs examples. The architect and his quality depend on what he sees not what he reads. I wish that the information we get in the courses was supported by audio-visual aids, or site visits, or models. For example, in the Working Drawing course, I wish there were a set of working drawings that we could see, and could note what goes into every sheet, and what the sequence of sheets is, and so on.

Bills of quantities is another area of this subject group which some of the student interviewees feel that is not dealt with by the curriculum. Ajmi (interviewed 1998) (KFU) says: 'We have never been asked to do any bills of quantities or anything like that.' Two students at KAU, asked by the researcher if they can deal with bills of quantity, indicate that this has played no part in their curriculum. Johani (interviewed 1998) says: 'This we have not touched on.' And Abu-Al-Khair (interviewed 1998) admits: 'I am in my final year, and I do not know what bills of quantities means.'

Likewise the treatment of the subject of Project Management in the curriculum is thought by interviewees to be deficient. The KAU teacher Mufti (interviewed 1998) says: 'The students finish the course still needing to know more about . . . project management.' Another architecture teacher, Haikal (interviewed 1998) (KSU), is so little aware of project management as an area dealt with by his school that he is not even sure if it is covered in the curriculum:

> Project management. I don't think that this issue is covered in the curriculum and I don't think that the student is well prepared to handle it. Some teachers, I believe, think that this is more a matter of business administration than the work of an architect.

A teacher from the same architecture school, Fadan (interviewed 1998), confirms both these points made by Haikal: 'This issue is not covered in the curriculum. Here in the School we believe this task should be learned only after a student has graduated.'

Rageeb, a teacher at KFUPM (interviewed 1998) states:

> The students in the School lack an understanding of the correct procedures that a project goes through in a real practice, from the meeting with the client all the way to handing the documents over to the contractor.

Some student respondents are also unhappy about the way the subject of Project Management is treated in the curriculum. Ajmi (interviewed 1998) (KFU) says:

> We studied two courses in Project Management, covering costing and working drawing. But we have not used the information we learned and we have not seen them applied, for example how an architect meets with a client.

The KSU student Ghanim (interviewed 1998) says:

> We studied this [Project Management] in a theoretical way with no link to the world of practice. We studied how projects should be managed from foreign textbooks, not as projects are handled in here.

Hilmi (interviewed 1998) (KAU student) states the same: 'We took one course in Project Management, but it was very theoretical.' Hashimi, a student at UQU (interviewed 1998), remarks: 'The courses were all theoretical.' And Johani (interviewed 1998) has the same complaint about this subject area: 'I would agree that the teaching methods are theoretical.' And he adds in another response:

> The subjects we study are theoretical. For example, the different clients we might meet in practice are taught to us theoretically. Theory, as we are learning, is very different from practice.

Another student respondent, Zinaigeer (interviewed 1998) (KFU) states:

> We did not study how we should write a contract with a client and what should go into the contract. We studied these things theoretically but we are suffering for the lack of live case studies.

A further KFU student Kazim (interviewed 1998) indicates an awareness of this client liaison shortcoming in the curriculum amongst students. He states baldly:

> We also did not study how to write contracts with a client, or how to write reports. The School did not teach us how to obtain building permits, though this is something that is required for any building. But we did not study anything about this – the paperwork required, who we should contact, etc.

It is, however, among practitioners that this deficiency in the curriculum and its consequences for practice are most frequently mentioned. The practitioner Fayez (interviewed 1998) says: 'The students lack . . . understanding of the client's needs. These things unfortunately are not addressed in the school.'

Another practitioner, Masoud (interviewed 1998), puts a similar point, again stressing that there is a shortcoming in the curriculum:

> Of great importance for new graduates, and an area in which the gap between training and practice manifests itself, are the non-technical aspects of architectural practice. I mean how to deal with people – any and all kinds of people. They have to learn how to meet with clients.

General administration, again not a technical architecture subject, is also commented on as an area where the curriculum is weak, and which manifests itself as part of the gap between training and practice. The practitioner Attas (interviewed 1998) remarks:

> The architect in the municipality does not work only as a designer but as an administrator, and the schools fail to prepare their students to work in the government, where all architects are involved in administration, such as report writing, etc. Further, building laws and the regulations of the municipality are not taught in the schools.

Attas illustrates this point, implying that the schools have failed to teach report writing:

> New graduates lack the awareness of management structures and lines of responsibility, such as the preparation of reports. I sent a graduate to write a report about a building needing repair and he didn't know how to do it.

A KFU student, Kazim (interviewed 1998), confirms that administrative matters such as report writing were lacking in the curriculum: 'We also did not study how to write contracts with a client, or how to write reports.'

Site supervision is another area where the curriculum is felt by some to be deficient. The practitioner Kurdi (interviewed 1998), recalling his own (recent) student days, comments on this:

> Also the curriculum lacks essential elements from practice, such as site supervision. When we studied architecture the teachers never took us to make site visits to experience the reality behind building construction.

Another practitioner, Bagabas (interviewed 1998), describes site supervision as 'completely missing from the curriculum'.

The KSU teacher Fadan (interviewed 1998) agrees that site supervision is not something that features in the curriculum in his school, despite it being an important part of architectural practice: 'Though this is part of the architect's work after graduation, this is not covered at all in the curriculum.' And Hariri (interviewed 1998), a teacher in a different architecture school (UQU), states: 'Site supervision, although an integral part of an architect's work, is not covered.'

The student Hashimi (interviewed 1998) (UQU), in response to the researcher's question about whether site supervision was taught, replies: 'No, we did not touch on this issue.' Zinaigeer (interviewed 1998), a student at a different school (KFU), responds in the same way to the same question: 'This is not covered in the curriculum. We haven't studied this', and Niazi (interviewed 1998), a student at yet another university (KFUPM), when asked if site supervision is covered in the curriculum, replies simply, 'No'.

One problem with the Professional Practice subjects as they taught are in Saudi Arabia lies in their content, that it is to say they are perceived by respondents to be imported and not relevant to Saudi Arabia. Rifai (interviewed 1998), another practitioner who believes students are under-prepared in this area, notes this point:

> When I was in the school there were not enough courses on this subject and it was theoretical. It was not linked to practice in Saudi Arabia. It was a course on Professional Practice and Construction Management as it is practised abroad, but not as it is practised in Saudi Arabia.

Likewise, the KAU student Hilmi (interviewed 1998) also believes that there is not enough local or Saudi relevance in some of the curriculum content in this subject area:

> The curriculum simply did not address the problems we might face in real practice in Saudi Arabia. We studied how professional practice and project management are done abroad, so we are not fully prepared for project management in this country.

Sedairi (interviewed 1998), a practitioner, attributes the problem to the distance between the schools and practice:

> I think that the relationship between the school and the practice is not close enough. The school does not know the exact needs of the market or how the practice operates. In our Department, for instance, we need site supervisors, we need architects who can work on working drawings and architectural details, and the writing of specifications. But we don't get them. And, as I told you, there must be a co-ordination between the school and the needs of practice.

If schools of architecture do not recognise and address professional practice as it is carried out in Saudi Arabia, and if the curriculum content in this subject area is imported and irrelevant to Saudi Arabia, the question becomes: Are schools the only parties to blame for this gap between architectural education and practice?

The examination of the Professional Practice and Management group and its delivery that we have provided has focused on the situation within the Saudi schools of architecture, but it should not be forgotten that there is another factor in the education/practice gap, indeed another suspect in the investigation into the causes of the gap, and that is practice. We have already come across some of the views that interviewees hold on practice (See Chapter 5), but it is worth noting some of the comments that they have to make specifically upon it and its relation to the architecture curriculum.

A number of observations about practice have focused on the fact that it is problematic for an architecture school curriculum, even if it were better integrated and better delivered, to prepare students to work in practice if certain areas of practice itself are poorly organised. For example, schools cannot teach about codes, regulations, and standards if these vary from architecture practice to architecture practice or if they are irregularly adopted or inconsistently applied. The teacher Haikal (interviewed 1998) (KSU) states:

> The dilemma architectural education is going through in this country is that practice is not organised. There is no written code, specifications, or details specifically for Saudi Arabia. Anyone can import any building material from anywhere in the world, and a contractor can start using it, without contravening any regulations.

The practitioner Rifai (interviewed 1998) is critical of teaching, but he lays the blame on the state of architectural practice in the country:

> The subjects today are in something of a mess. The teachers do not know what to teach the students, because practice is not consistent, and there are to some extent no fixed standards there. The result is that each teacher tends to teach a subject according to his own training background. So teachers who have graduated in America teach the American details and specification, teachers who have graduated in the UK teach the British way of doing working drawing, and so on.

The practitioner Fayez (interviewed 1998), President of a major architectural firm, admits:

> For our working drawings, architectural details, and specifications we use the American code and standards. Since there is no Saudi code or standards, this was our choice. You have to follow some system, so we followed the American one. As for the architectural details, it depends on what is available in the market.

The practitioner Aba-Al-Khail (interviewed 1998) even goes so far as to claim that it is misleading to speak glibly of an education/practice gap, as it diverts attention from the cause:

> There is no professional practice in Saudi Arabia for there to be a gap. The problem lies with architectural practice, for architectural practice is not organised. Every architect refers to a different set of standards, depending on how he was trained. There are fixed standards, so the school is lost as it does not know what to teach. When the student graduates, he does not know what his functions are. In America or Europe the architect at least has an idea of what he is going to do in an office.

It seems unmistakable from the observations made by interview respondents that there is felt to be a wide distance between the curriculum and the practice of architecture as far as Professional Practice and Management subjects are concerned. There are numerous comments on the inability of students to appreciate the way that the day-to-day business of architecture is conducted, from an inability to design to budget to a lack of understanding about what bills of quantities are! It is also clear that most interviewees identify the curriculum content and its delivery as being a major part of the problem in this respect. There is a failure to give instruction in some subject areas, and a failure in others to relate what is taught to the way it is carried out in practice.

Clearly, in the area of Professional Practice and Management there is a great gap between education and practice.

8.8 Complementary Studies

This group is divided into three subgroups: electives, covering undergraduate in-depth study of any architecture subject area; research and written dissertations, covering graduation project theses, research methods in architecture, and research and programming; others, covering interior design, surveying, conservation and historic buildings.

Fig. 8.7 indicates the statistics for this subject group: KSU, in the Architectural Design option, 5 credit hours (2.85% of the total); KSU, in the Building Science option. 2 hours (1.14%); KFU, 20 hours (12.12%); KAU, 10 hours (6.06%); KFUPM, 15 hours (8.19%); and UQU, 12 hours (7.18%). Even although in all cases the credit hours are fairly low in number, they nevertheless vary greatly from school to school. The lowest numbers are found in KSU. This is related to the fact that KSU does not offer elective courses as such, but this is compensated for by the division of architecture student into those specialising in Architecture Design and those specialising in Building Science.

The importance of this subject group to an architectural curriculum lies in the fact that to be dynamic and responsive a curriculum needs to be regularly updated, and when elective courses are available, it is an excellent opportunity for the school to develop new courses and to rejuvenate the curriculum. The school can try a new course and refine it, and if it is deemed successful it can be incorporated into the regular programme. In addition electives and complementary courses offer a way for students to pursue specialist interests within the architecture field. These courses will widen the horizon of the students for they allow the students an opportunity to pursue their own interests in the field of architecture, and to develop their specialisations, as well as the opportunity to widen their career prospects to include architecture-related work.

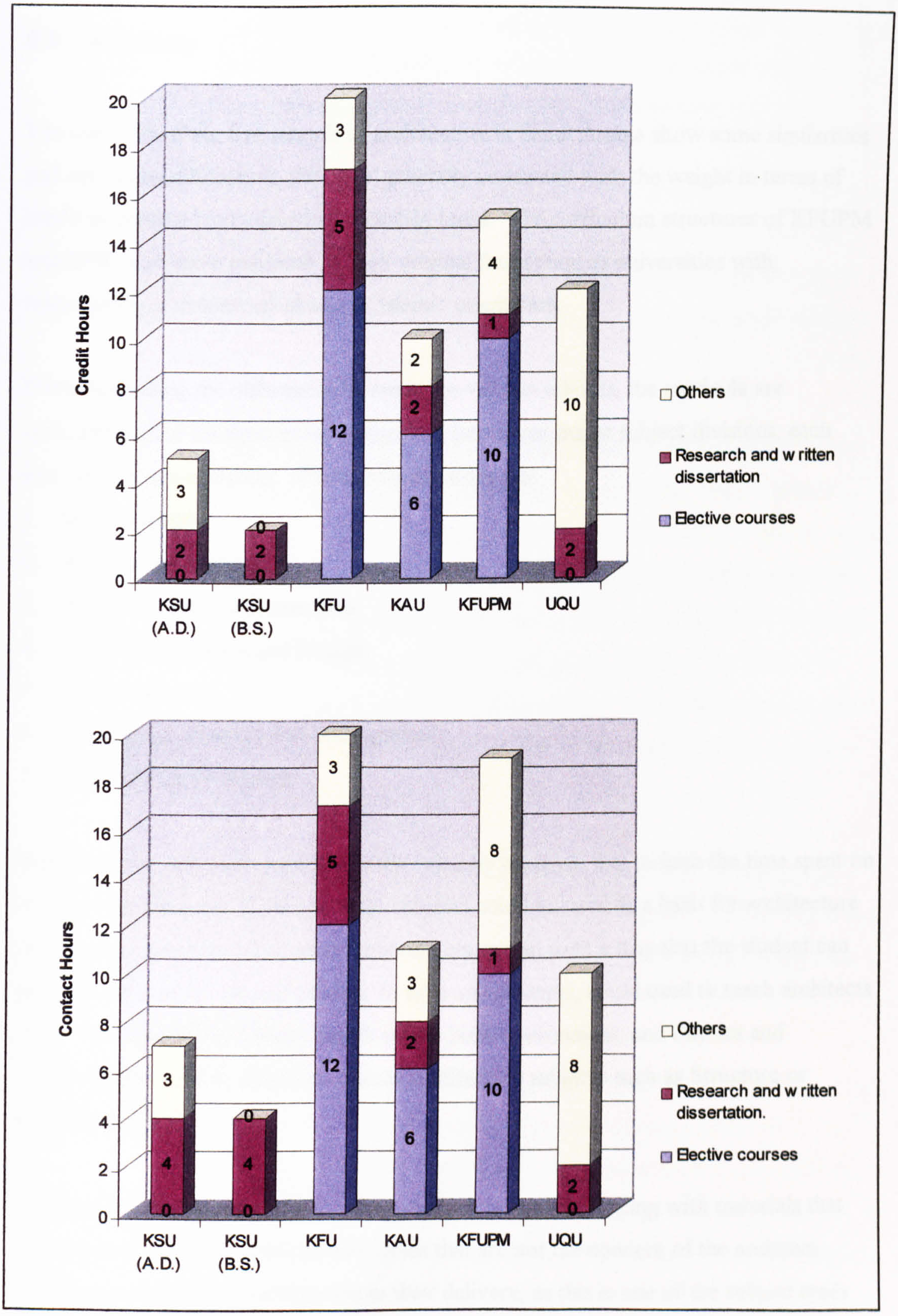


Fig 8.7: Credit and contact hours distribution of Complementary Studies subgroups

8.9 Summary

The curricula of the five schools of architecture in Saudi Arabia show some similarities and also some differences, the latter generally connected with the weight in terms of credit or contact hours devoted to certain areas. The curriculum structures of KFUPM and UQU also show evidence of their original foundation as universities with, respectively, a technological and an Islamic orientation.

Notwithstanding the differences between the various schools, the curricula are sufficiently alike for them to be categorised into seven major subject divisions, each with several sub-divisions. These main divisions are:

1. Basic subjects.
2. Building Technology.
3. Social Studies and Humanities.
4. Project Preparation and Design.
5. Communication..
6. Professional Practice and Management.
7. Complementary Studies.

Basic Subjects are often seen as of little value by students, and to limit the time spent on architecture subjects. However these subjects could be used as a basis for architecture courses and could be linked to architecture courses in such a way that the student can see their relevance. Islamic Studies, to take one example, could used to teach architects about the influence of Islamic beliefs on the built environment, and Physics and Mathematics could be linked to science architecture subjects such as Structure or Building Science.

Building Technology subjects also seem to lack relevance, dealing with materials that are not used in Saudi Arabia or with fields that are not the concern of the architect. Furthermore there are inadequacies in their delivery, as this is one of the subject areas where teachers are too tied to the blackboard instead of being ready to utilise other teaching techniques. Little use is made in this subject group of lab or workshop facilities and there is a perceived failure to integrate individual subjects with the design studio. There is a considerable gulf between what is taught in the Building Technology courses and what actually happens in architectural practice, so that students are therefore under-prepared in this area for the profession of architecture.

In the Social Studies and Humanities category, yet again, the relevance of the subjects is not always appreciated by students or teachers. The reason for this is often that the subject content has little to do with practice in Saudi Arabia, or that the teacher is so distanced from the day-to-day realities of his subject area, whether through being non-Saudi or for the general reason that teachers cannot practise.

The analysis of the Project Preparation and Design subject area shows that there is a wide gap within the curriculum structures, design projects not being well integrated with other subjects, and also between the design project work students do and the work they will do in architectural practice. Interviewees relate the latter gap to the fact that there is no integration between the design studio and support subjects, which is in turn caused by factors including a lack of curriculum management, student tendencies to compartmentalise, and the credit hour system. Respondents also point to the fact that teachers are themselves not permitted to practise, and to the fact that there is an over-emphasis on the theoretical aspects of design.

As for the Communication subject group, general failings in this area, as well as the lack of presentation skills, are clearly major handicaps to the student when he enters the architecture profession. They are yet a further manifestation of the gulf between what the students receive at school and what they need for practice.

There a wide distance between the curriculum and practice as far as Professional Practice and Management subjects are concerned. Students are not enabled to comprehend the way that the daily business of architecture is conducted, especially in regard to budgeting and administration. In some areas the subject appears not to be taught, and in others the curriculum fails to relate what is taught to the way it is carried out in practice. In the area of Professional Practice and Management there is a great gulf between education and practice.

Complementary Studies, including electives and research activities, take up only a small proportion of the curriculum in the Saudi architecture schools. However, elective courses could be used more widely to give a curriculum the adaptability and vigour which it needs to keep up to date, as far as is possible, with the practice of architecture, and to give architecture graduates the flexibility to find work in areas outside mainstream architecture.

Large though the gap between the two may be, the curriculum cannot be considered in complete isolation from practice. Practice affects what is taught in schools in a number of ways, including failing to act consistently in the matter of regulations, codes, and standards. No matter how well organised and how well delivered a school curriculum may be, it cannot close the gap between education and practice if practice does not provide it with consistent procedures and norms to aim at.

Various themes relevant to the education/practice gap, though not specific to only one subject division of the curriculum, have arisen in the comments that interview respondents have offered. These include the observation that teachers are certain to be distanced from practice since they are not permitted to practise, that teaching is in general too theoretical, that the curriculum is not well integrated - in particular that support subjects do not feed into the design studio - that much curriculum content is considered irrelevant, especially to Saudi Arabia (being 'imported'), and that students have no grasp of the daily constraints on architectural practice.

It will have been apparent from the analysis of the researcher's fieldwork interviews that many of the responses made by interviewees about the curriculum in Saudi architecture schools apply not only to the specific subject area being discussed, but also to the curriculum in general and to its relation to architectural practice in the country. Themes that recur in relation to several different subject divisions include the view that at teachers must, in the nature of the system, be distanced from practice because they are not allowed to practise, that there is a weakness in teaching approach, with subjects being taught too theoretically, that there is no integration between the design studio and the other architectural subjects, that there is an over-emphasis on design (and even a misunderstanding of what design involves in actual practice), that much of the curriculum is imported and not appropriate for Saudi Arabia, and that students are not prepared to meet the real constraints of practice, such as finance and the needs and wishes of clients. Wherever the causes of the gap between architectural education and practice in Saudi Arabia lie, it is clear that an analysis of the curriculum in the architecture schools throws great light upon them.

Chapter 9

Conclusion and Recommendations

9.1 Introduction

Now that the research, including the analysis based on the researcher's fieldwork interviews, has been carried out into the manifestations and the causes of the gap between architectural education and practice in Saudi Arabia, it is appropriate to move to the final stage of this study.

This chapter accordingly sets out the findings which the research has made possible and makes recommendations based on these findings to deal with the problem of the gap between architectural education and practice in Saudi Arabia.

9.2 Summary of Thesis Chapters

The chapters of the thesis are summarised below in order to present the thesis in outline form and to act as an aid to the location of relevant material in greater detail.

This study has taken as its starting point the gap that is generally perceived to exist between architectural education and practice, particularly in Saudi Arabia. The researcher has been concerned to indicate the manifestations of the gap, to elicit the causes of the gap, and to make recommendations aimed at eliminating or lessening the education/practice gap.

Chapter 1 has set out the general background to the study, indicating the researcher's awakening of interest in the gap between education and practice. The chapter has stated the problem of the gap and has indicated the various ways in which it manifests itself with particular application to Saudi Arabia. The chapter also presents the objectives of the study - to indicate the nature and causes of the education/practice gap and to make recommendations to deal with it. The research questions, the structure of the thesis, and the limitations of the study are stated.

Chapter 2 deals with the fieldwork undertaken by the researcher primarily in Saudi Arabia in order to substantiate and expand upon the indications about the nature, extent, and causes of the education/practice gap which had been gleaned from the literature and from personal experience and observation.

The chapter discusses the decisions about methodology, research design, method of data collection, and sampling approach which had to be made. It gives an account of the various options open to the researcher and clarifies the reasons behind the decisions to adopt a qualitative methodology, a descriptive approach, a survey type of research design, and an interview data collection technique. A description is offered of the researcher's main fieldwork, which took place during a trip lasting some three and a half months to Saudi Arabia and Egypt.

Chapter 3 looks at the evolution of the architecture profession and its relationship to the training of architects over the years. It examines how the five principal architectural education approaches in the western world - those of apprenticeship/pupillage, the art academy, the polytechnic, the Bauhaus, and the modern university - have related to the work of the architect. Changes in the training systems have grown out of responses to developments, whether technological, philosophical, or social, which have defined the role of the architect, while the training changes themselves they have in turn helped to shape the role of the architect.

This chapter identifies, in relation each of the systems, the gap between education and practice through history. By the time the prevailing training system had become that of the university, the gap between training and practice in architecture was complete, in contrast to the earliest times of the apprenticeship system, where the gap was minimal or altogether absent.

Chapter 4, through the study of three countries, the UK, the USA, and Egypt, has provided an account of their different architectural training traditions, with some similarities and some points of contrast between them. The study affords examples of the part played by the changes that have taken place in the role and function of the architect in shaping the nature of architectural education.

The chapter looks particularly at the historical background to architectural education in the three countries, at the role of the architect in each country, the part played by professional associations (including quality control), and the typical routes to the practice of architecture which characterise the three systems. Especially instructive is the fact that, although the education of architects is carried out in institutions outside practice in all countries, so that the education/practice gulf exists, there are strong links with practice in the UK and the USA, which go some way towards bridging the gap.

Chapter 5 gives an account of architectural practice in Saudi Arabia set against the historical, geographical, climatic, demographic, and cultural background of the Kingdom. After describing briefly the traditional architecture of Saudi Arabia the chapter shows how contemporary architecture fails, unlike traditional architecture, to meet the needs of the people. It describes how architecture has a poor reputation amongst the public in the country, and how, although architectural education has received much of the blame for this, the poor organisation of the profession and the introduction of foreign influences have also played a part.

The chapter outlines how a lack of standards and regulations has hindered the development of architecture in Saudi Arabia, and how various measures have contributed to the loss of public confidence. While loss of confidence is one factor which causes clients to go elsewhere for building design, so too is the fact that anyone in Saudi Arabia can design a building.

Chapter 5 moreover describes how the lack of a strong and effective professional association to regulate architectural practice and to monitor education has also played its part in the low standing of architecture in the country. It is also a major cause of the education/practice gap, since practice offers little in the way of standards or models for educators to aim at. Recent years have seen an increased awareness of the situation amongst architecture professionals and teachers, and a greater willingness to address the problems.

Chapter 6 sets out the general picture of education in Saudi Arabia. The organisation of education and its development, especially in relation to the economic emergence of Saudi Arabia since its establishment in 1932, are related. General (pre-university) education covers primary, intermediate, and secondary education, and is now administered by the Ministry of Education and (for female pupils) the Presidency of Girls' Education.

Formal education has been advancing in the Kingdom since the 1930s, and it has been one of the main focal points of the Five-Year National Development Plans. Recent years have seen a great increase in the population's literacy rate, and the number of schools has grown greatly. Of particular interest for the present study is the fact that in high schools pupils are divided into those concentrating on science subjects and those concentrating on arts and humanities. Students to architecture courses are admitted only from the science stream.

The chapter relates how until the 1950s Saudi students had pursued higher education outside the Kingdom. In 1957 the first Saudi University (now KSU) was founded, and the Kingdom now has seven universities and some 80 colleges. The organisation of Saudi universities tends to follow western, in particular American, models, since much of the early input in terms of teaching staff and administrative advice was from the United States.

The government agency responsible for higher education has been since 1975 the Ministry of Higher Education. Its establishment was a reaction to the expansion in higher education, which in itself was related to the development of the Saudi economy and the country's integration into world markets. Higher education is free and financial support is also given for books, meals, accommodation, and transport.

The structure of individual universities in Saudi Arabia are similar because they are basically functions of the Ministry of Higher Education and most major policy decisions are made at Ministry level. Nevertheless, as Chapter 6 describes, within the statutory limitations universities do show some diversity.

Chapter 7 focuses on architectural education in Saudi Arabia, setting the emergence of the five architecture schools against the background of the economic development of the country and its previous architectural training tradition. The chapter describes the origins, development, and distinctive characteristics of each of the Saudi schools, as well as their aims and objectives.

This chapter also deals with students in the architecture schools, in particular commenting on the type of student that enters architectural education, the admission and educational policies affecting this, and the relative numbers at each school. Attention is drawn to the widespread dissatisfaction on the part of teachers with the quality of students entering architectural education.

Teaching and teachers at Saudi architecture schools are themselves also discussed in Chapter 7, particular attention being paid to their isolation from the realities of practice, whether through the fact that they cannot practise or, in the case of non-Saudis, the fact that they are not familiar with Saudi needs and culture. This isolation identified by many as a major cause of the education/practice gap.

This chapter also examines the physical academic resources in the Saudi architecture schools, primarily looking at the library, workshop, and lab facilities, but also considering the general environment they offer to students. The general under-use, for a variety of reasons, of resources is noted.

Also investigated in this chapter is the practical training system in Saudi Arabia. This is universally regarded a completely inadequate, and as a major contributing factor to the inability of new architecture graduates to cope with the world of architectural practice.

Course duration and structure are also examined in Chapter 7. It is shown that, although a course of five years - often less in real terms - is accepted to be too short, attempts to lengthen it are thought likely to meet with drawbacks, acting as a discouragement to potential architecture students.

Chapter 8 looks in detail at all aspects of the curriculum in Saudi architecture schools, and it is assessed in the light of the comments made about it by the respondents interviewed by the researcher during his field trip. The assessment is made in terms of both structure and subject content, although it is often difficult to separate these two aspects from each other, or either from curriculum delivery. The curriculum subjects are divided into their major classifications and details of the proportion of the curriculum devoted to each in the five schools are provided.

The chapter reveals that there is general dissatisfaction with the architecture curriculum amongst students, teachers, and practitioners alike. Some subjects are regarded as wholly irrelevant, often because they are functions of an 'imported' curriculum not suited to the Saudi situation, while others are thought not to be properly integrated with other subjects, in particular with design and the work of the design studio. Design is thought by many to be too abstract and theoretical.

This chapter shows that it is not only in mainstream architecture areas that the curriculum is thought to be deficient, but that it fails to deliver to the student the necessary information and skill to deal with communication, administration, and management aspects of architectural practice. A few respondents, however, believe that it is not the job of the architecture school curriculum to prepare the student in these areas.

Many interviewees are unhappy with the duration of the curriculum and with its credit hour structure, although there is a general feeling that attempts to lengthen the course will only meet with frustration.

Chapter 8 also illustrates that the gap between education and practice is perceived by all sections of the architecture community in Saudi Arabia, and that while structural and content elements of the curriculum are widely held to be responsible, there is an awareness that the gap between education and practice is a systematic, even institutionalised, component of the Saudi architectural scene in general, and that the solution to the problem does not lie in changes to the curriculum alone.

9.3 Conclusions

The starting point of this study has been the acknowledged gap that exists between architectural education and practice in Saudi Arabia. The research, through a study of the literature and through the investigations carried out by the researcher during his field trip, has been able to draw certain conclusions about the cause of this gap.

The causes of the gap between architectural education and practice in Saudi Arabia may be found within both education and practice, and indeed in the relationship between the two. In the case of any one identified cause, it may be difficult to put it exclusively into one category rather than another, and there will be a certain amount of overlap as far as classification is concerned. For convenience, however, we will categorise causes into causes within education and causes within practice.

9.3.1 Causes within Education

It should be noted right away that there is bound to be, to a certain extent, a gap between education and practice in architecture simply because the training for architecture (with the exception of the practical training period under those systems where there is such a thing) takes place in universities. This is true both of Saudi Arabia and of other countries. That is not to say that all university architectural education takes place in an 'ivory tower' utterly remote from practice. It is rather an acknowledgement that practitioners may have to adopt new techniques and approaches to solve on-the-spot problems, or that some architects may introduce innovative design concepts in the course of their work. They do not feel obliged to consult or inform architecture educators that they are doing so. It is not possible then, in the nature of the things, for education always to keep up to date with the innovative aspects of practice no matter how well-regulated and indeed co-operative the relationship between them may be. Equally, it may take architectural education some time to catch up with the use of new building materials or techniques.

Some of the causes within education of the gap between architectural education and practice lie in pre-university education. We have noted that there is nothing in the Saudi high school curriculum that would arouse or satisfy an interest in architecture either as a career or as an engaging area of human achievement. There are, for instance, no art or drawing classes in high schools. This lack of stimulus for potential architects and lack of information about the study and profession of architecture mean that a proportion of those who go on to study architecture are not suited to it; while this fact may not itself be a major cause of the education/practice gap, it is bound to have an exacerbating effect on it, making the student less receptive to what he is taught and less eager to please when he enters an architect's office.

Further, the study and learning habits that are picked up in high schools also make for students whose interest in their area of study for its own sake may be overshadowed by an eagerness to learn 'facts' and repeat them parrot-fashion to pass exams. The exam system in Saudi high schools encourages the pupils to study to gain exam passes rather than truly to understand their subjects and integrate them with other subjects studied; they are not taught to see the 'bigger picture'. Again, not perhaps a major *cause* of the gap, but an intensifying factor.

A similar intensifying factor in the education/practice gap is the part played by the admissions policies in Saudi universities. Students admitted to architecture schools are taken only from the science stream rather than from the arts and humanities stream of the Kingdom's high schools, so that the pool of students with a potential interest in and aptitude for design is diminished. The exclusive selection of students from a science background may be connected with the view that an architect is some kind of engineer, a legacy of the Egyptian influence in the early days of formal architectural training in Saudi Arabia.

A further fact to note is that the architecture schools are unable to carry out any screening of the students who come to them; the decisions about who will be admitted to architecture studies are made by the university admissions offices, and the schools have no choice in the matter.

A further point distancing architectural education from practice is that only 'theory' students are accepted into the schools, that is to say, students who come straight from an academic high school background. There is no intake of mature students from a craft or technical background, who have entered the technical side of building or engineering through a less academic, non-high school path. Such students, if they prove equal to a university course, would bring with them the great advantage of having spent some actual time in the day-to-day building industry, and their knowledge and experience would be bound to help in bridging the education/practice gulf. The absence of students with such a background is a factor in maintaining the gap between architectural education and practice.

Architecture schools themselves lack clearly stated aims and objectives, and within schools the particular objectives of the study of an individual subject are not always clear. In practice one may of course say that the actual programmes and courses presented by schools imply their aims and objectives. But the absence of clearly articulated goals means that any school must start on the wrong foot as far as meeting the needs of practice and the building industry is concerned. It could be legitimately asked: 'What is this school aiming to produce? Designers? Construction engineers?', and so on. If architectural education is unclear about its goals, is it surprising that it seems at times to be directionless? This must contribute to the gap between what is taught in the schools and what happens in practice.

Within the Saudi architecture schools the gap between education and practice is caused partly because the schools have, in general terms, an imported curriculum. We have seen that Egyptian and, in particular, western influences played a big part in the setting up of Saudi architecture schools and in the structure and design of the curricula. This means that in many cases what is being taught is not suited to actualities of Saudi practice. Structure classes, for example, may assume the use of certain construction materials, whereas these materials are not indigenous to Saudi Arabia and are in fact little used in construction in the country.

One of the biggest single factors, identified as a reason for the gap between architectural education and practice in Saudi Arabia is the isolation between education and practice caused by the fact that architecture teachers cannot practise architecture. We have categorised this a cause within education, since it seems essentially a particularly striking feature of the Saudi architectural *education* system, but in fact it might as well be characterised as a feature of architecture as a whole in the Kingdom, not just the educational side of the situation. Teachers, of course, teach in the schools, and in that sense the fact that they cannot practise is a feature of the schools, but the consequences of this isolation manifest themselves not so much in the schools but, as we have seen from the comments of so many writers and interview correspondents, when graduates first go to practice. That teachers cannot practise is a fact about practice as well as a fact about education.

That architecture teachers do not practise is also a matter not specific to architecture schools, in the sense that it is not a condition imposed by the schools, nor indeed by the architecture profession; rather, they not *permitted* to practise by the law. In addition to the fact that teachers are not allowed to practise, the normal career path for an architecture teacher, whereby the students with the best marks are offered positions as Teaching Assistants on completion of their undergraduate studies, means that they do not even get the opportunity to spend some years in practice before going on to teach; their isolation from practice is complete. Some years in practice before teaching would not protect teachers against isolation from innovations within practice, as long as they were not allowed to practise while they were teachers, but it would familiarise them with office procedures and give them first hand experience of what the real priorities and requirements of architectural practice are.

A number of teachers in Saudi architecture schools are non-Saudis, and they have the advantage of having had some personal experience of architectural practice outside Saudi Arabia. However, this advantage is often counterbalanced by their unfamiliarity with or lack of sensitivity to Saudi cultural values. Again, this means a gap between what they teach and what happens in practice.

As we shall see below, practitioners in turn are isolated from education, since they are not permitted to assist with teaching.

A further cause of the gap between architectural education and practice in Saudi Arabia lies in the actual teaching that takes place. It is clear from the remarks of many of the researcher's interviewees that there is widespread dissatisfaction with the quality of teaching, and this is identified quite apart from curriculum content or curriculum design. Too many teachers appear not to be able to teach. Criticism often characterises the teaching as being too 'theoretical', by which is commonly meant that it is too tied to blackboard methods, and that the practical application of the information being imparted is not accentuated enough. To a certain extent this may be seen as a matter of curriculum integration or design, and in some cases as a matter of the subject being taught, but most comments are specific that it is teaching technique and approach that they are criticising. There is a feeling that there is not enough use of teaching aids and that there are not enough practical sessions, such as site visits, to make subjects come alive. There is the further consideration that Saudi architecture teachers undertake no form of teacher training and have no particular knowledge of the psychology of learning (See Appendix VI). Clearly, even if the material that is being taught is good and relevant to architectural practice, if it is not being successfully transmitted to the student he cannot assimilate it and bring it to practice. Poor teaching method is therefore a cause of the gap between education and practice, though there is a recognition that teachers are under pressure from the constraints of credit hours and administration requirements.

A further difficulty encountered in the Saudi architecture schools, and a further reason for the education/practice gulf, are the constraints placed upon learning by the physical academic resources of the institute concerned. These matters vary between the schools, but the general picture that emerges is one of ill-equipped or at least under-used library, workshop, and lab resources. There is reported a shortage of text books and journals in libraries, and labs and workshops often are too few, or not well appointed, or cannot be used for one reason or another (sometimes because there are no qualified technicians). While much financial outlay has gone into equipping the Saudi universities with academic support facilities, it seems that it has not necessarily been targeted well. Clearly effective training is inhibited by these deficiencies, and this must contribute to the gap between education and practice.

Some respondents have also mentioned the problem caused by the necessity to know some English, at least for some purposes, to complete the architecture programme. Some teaching is done in English, and there is a great shortage of available text books and journals except in English. Clearly the use of English and, in the case of many students, the need to learn it are barriers to effective communication and teaching and therefore, no matter the quality of the material taught, must contribute to the education/practice gap.

The structure and content of the curriculum in Saudi architecture schools have received much comment. Some of the subjects in their entirety and some of the content of the subjects are seen by some respondents as irrelevant. Basic subjects, university requirements not directly related to the architecture course, are often rejected as of no relevance.

We have noted above that, to some extent, the curriculum of Saudi schools is imported, and what is taught is in many cases more appropriate to countries other than Saudi Arabia. Clearly it is difficult at times to separate criticism of curriculum structure and content from criticism of its delivery, but history and theory courses are often thought to be of no relevance, and while different teaching approaches might help here, there seems too much emphasis on western and classical themes at the expense of local ones.

The position of design and the question of its relation to the other architecture subjects in the curriculum often comes in for criticism. There is a lack of curriculum integration in that support subjects generally do not seem to feed into the design studio, as interviewees feel they should. Again this is to some extent a matter of teaching method, but the overwhelming impression is that this is a systematic failure, and one that could be addressed by changes in the curriculum structure.

On the other hand, many respondents comment on the primacy of design and the fact that it appears at times to be regarded, abstractly conceived, as *the* activity of the architect to the exclusion of other activities pertinent to building processes. This is an attitude at variance with the realities of practice, albeit that some practitioners may also hold such notions of design, but hardly a surprising one given the isolation of teachers from practice. Design, then, appears to be in a position of some tension. Its primacy within the architecture curriculum is implicitly acknowledged by the criticisms that support subjects are not properly linked to it in the design studio. However, many feel that it is also elevated in the studio to an abstract and impractical aesthetic exercise, which is not how things are in practice.

Problems with the position of design again arise when the Project Preparation and Design subject area in architecture school curricula is studied. A wide gap is perceived between the work students do for their design projects and the work they will do in architectural practice, and this is commonly attributed to the lack of integration within the curriculum. Respondents also relate the gap to factors we have already noted: the fact that teachers are themselves distanced from practice (not being permitted to practise), and to the fact that there is an over-emphasis on the theoretical and aesthetic aspects of design at the expense the building itself - which is the actual concern of architectural practice.

There is concern amongst the interviewees that the curriculum makes little serious attempt to teach presentation and communication skills. This is clearly a major cause of the education/practice gap, as the inability of new graduates to relate to clients on a day-to-day basis is one of the realities most frequently commented upon, particularly by practitioners.

The skills that one might expect to be developed by courses in the Communications subjects group shade over into the Professional Practice and Management group of the curriculum. It is evident from interviewees' comments that there is a wide gulf between the curriculum and the practice of architecture as far as these subjects are concerned. Students are not trained to appreciate the way that the day-to-day business of architecture is conducted. It is also clear that most interviewees identify the curriculum content and its delivery as being a major part of the problem in this regard. Instruction is lacking in some areas, and a there is a failure in others to relate what is taught to the way it is carried out in practice. Unequivocally, there exists in the area of Professional Practice and Management a great gap between education and practice.

As far as the Complementary Studies curriculum group is concerned, most of its emphasis is on elective courses. These form only a small part of the credit hour time in those schools which offer electives (KSU and UQU do not), though there are wide variations. The comparative lack of flexibility in elective courses helps to create a gap between architectural education and the world of practice because it inhibits the potential of the student to develop a specialist field and to pursue a career in an architecture-related area.

The duration of the architecture course is often picked out as a factor inhibiting the training of architecture students. Although in all five schools the courses have the same duration - five years - a close examination of the number of credit hours devoted to architecture subjects as opposed to subjects of general university requirement in the schools reveals that in one school, for example, there is the equivalent of just 3.1 years 'real time' devoted to the teaching of architecture. Even in the case of the schools with a higher proportion of time devoted to architecture subjects, five years is generally considered too short. Whether it is realistic to seek a longer course is doubted by many respondents, but the short time available to 'pack in' so much instruction is surely a factor affecting the quality of teaching and thus a cause of the gap between architectural education and practice in Saudi Arabia.

A major cause of the gap must be the system of practical training used in architectural education in Saudi Arabia. The 'summer training' is of very short duration, from four to eight weeks, and is universally regarded by students, teachers, and practitioners alike as totally inadequate. The training is not supervised by the schools, and there is no programme for trainees to follow or list of procedures and practices of which they must gain experience. No-one appears to take it seriously, and it fails absolutely to provide training for the world of architectural practice. Saudi architecture graduates effectively begin work in architecture offices with no practical training whatever behind them, a clear and unambiguous cause of the gap between education and practice.

9.3.2 Causes within Practice

It is important to note that, while the prevailing suspicions when the researcher began his study, and the opinions that he met with most frequently from his interview correspondents, were to the effect that the causes of the gap between education and practice lay in education, the picture that emerges after research is somewhat different. It has been discovered that practice, too, is a major culprit.

The main difficulty contributing to the gap in respect of practice - though its effects are not confined to practice - is that it is not organised properly, and this is largely due to there being no effective professional association comparable, for example, to the RIBA in the United Kingdom or the AIA in the USA. There exists the Omran Society, but it is really like a professional club, not an organisation with statutory power. Its activities include hosting conferences, producing academic papers, and so on.

The absence of an effective professional body has a number of consequences. It means that there is no regulation of professional practice, with no laid-down norms or procedures, and if there are no such norms then education, even if it were more effective than it is, has nothing to aim at other than the conventions of the moment, inasmuch as they can be perceived. It means that there is no effective and objective quality control of architectural practices and procedures, and it also means that there is no objective body exercising quality control on architectural education. In the absence of a professional association there is no agency accrediting or even monitoring architecture school courses, and no agency to act in an advisory capacity or to provide advisory personnel to schools. It means, indeed, that there is no formal contact at all between the profession of architecture and the architecture schools, although individual practitioners may act as project jurors.

The lack of a professional body is associated with a lack of control of actual entry into the profession following the academic part of the path to architectural practice. There is no professional examination or registration required to practise architecture in Saudi Arabia, with the result that anyone can do it, whether an architecture graduate or not. Again this means an inevitable gap between education and practice. An effective professional association could also lay down practical training requirements and assist in monitoring such training. We have already noted that inadequate practical training is a major cause of the gap between education and practice.

The absence of an effective professional body also means that there is no body to represent the architecture profession to the public, or to advise the government on architecture matters. The prestige of architecture in Saudi Arabia is low compared to that of many other professions, and an effective and respected professional association would help in this respect. An effective statutory body could also present matters of architectural concern to the government or to MOMRA, increasing the possibility of changes in laws and regulations (such as the law banning teachers from practising).

Another aspect in which practice is not organised in Saudi Arabia is that there are no agreed building standards to which the profession adheres throughout the Kingdom. The result is that some firms use American standards, some other western standards, some locally devised standards, and so on. With no regularisation of codes and standards, education, again, cannot aim at anything specific, and so the gap with practice is maintained.

Indeed there is not just a lack of unanimity within practice about building standards, but there are few actual statutory legal building regulations (the main exceptions being setback and height regulations), so that there is once more little for education to aim at in training students.

Just as teachers cannot practise, so practitioners cannot teach architecture, even on a part-time or consultancy basis. Clearly this maintains the distance between the profession and education, since input into education from those in direct touch with current architectural practice is absent.

We will now offer recommendations to deal with the gap between architectural education and practice in Saudi Arabia.

9.4 Recommendations

The recommendations to deal with the gap between architectural education and practice in Saudi Arabia are directly linked to the causes of the gap as revealed by the present study. Some of the recommendations that will be put forward are general and some are more particular. In making the recommendations the researcher has borne in mind the potential constraints that apply to their implementation, and has therefore sought to suggest that attention should be given to certain areas rather than to suggest that specific measures should be introduced without further consideration.

The main recommendation is that consideration should be given to the establishment of a statutory professional association for architecture in Saudi Arabia, with a role similar to that played by the RIBA in the United Kingdom and the AIA in the USA. The framework for the setting up of such a body and the mechanism for its operations and procedures already exist to some extent in the Saudi Omran Society and the Engineering Committee of the Ministry of Commerce. An effective professional body would have powers and responsibilities that would require to be worked out in detail that is beyond the scope of this thesis, but it would deal with areas outlined above, particularly in Section 9.3.2, identified as causes of the gap between education and practice. Indeed one of its stated aims should be the establishment of closer links between the profession of architecture and architectural training.

The consideration of the setting up of an effective professional association with the requisite authority and administrative structure would be the single most telling development that could reduce the education/practice gap, as it would be able to deal with many of the other recommendations outlined below. It should therefore be given first place in any list of recommendations, both logically and chronologically.

Other recommendations include consideration of the institution of proper registration procedures, including the registration of the title 'architect' and the holding of professional examinations. These procedures and examinations could be under the control of the professional body.

It is also recommended that thought should be given to the introduction of comprehensive, nation-wide building standards, codes, and regulations. We have already noted that the absence of such norms means that education, no matter how well organised and carried out, must be distanced from practice because practice has itself no set of norms which it consistently follows. Again, an effective professional association could act in an advisory capacity to the legislative authorities in the establishment of building standards and regulations.

A further area which could come under the supervision of a professional body - jointly with the Kingdom's schools of architecture - would be an effective period of practical training before students can be registered as architects, and this is therefore recommended. Thought would require to be given to the structure of such a training period and its place in the career path towards becoming an architect. But whether it becomes an integral part of the architectural education course (and then it would perhaps precede the final year in architecture school), or whether it follows graduation but becomes a requirement for registration, there can be no doubt from the evidence this study has produced that it would play a major part in reducing the gap between architectural education and practice. The practical training period should be appreciably longer than the current summer training, there should be specific areas which it must cover, and it should be fully monitored, perhaps by architecture school staff, and ultimately under the oversight of the professional association.

An effective professional body could also encourage and stimulate the architecture profession in a number of other ways. It could, for example, give the architecture profession a higher profile and a greater prestige with the Saudi public, and it could provide an impetus for more research and discussion within the architecture community, resulting in a greater number of Arabic language journals and books devoted to architectural matters.

As far as education is concerned. It is recommended that some attention should be given to pre-university education. In terms of the curriculum, there should be art or craft-related classes and consideration should be given to the introduction of classes providing information about architecture and to the possibility of architecture as a career. Although it may at present be a remote possibility, thought might be given to the curriculum and teaching approach in the nation's high schools, which encourage pupils to aim at passing exams rather than to assimilate knowledge, an attitude which many carry on to university.

It is recommended that universities should consider widening the base from which they select students to study architecture. Instead of the present system, which means that only students from the science stream of high schools get offered places in Saudi Arabia's architecture schools, advantages might be gained by accepting students from an arts and humanities background, and a particular step towards closing the education/pr gap would be taken by being prepared to accept students who take a less direct route to architecture, perhaps through first working in the technical side of the building industry. There should be more screening of potential architecture students to assess their aptitude for and genuine interest in architecture.

It is recommended that architecture schools should take more care to state their aims and objectives clearly. Particularly if the general architecture situation in Saudi Arabia undergoes change, and if there develops, perhaps under the influence of an effective professional body, a consistent set of norms and practices within the building industry, then it will be both easier and more advantageous in closing the education/practice gap to articulate the goals of the schools unambiguously.

As far as curriculum structure and content are concerned, a major worry is the perceived irrelevance of much of the programme. One recommendation, therefore, is that attention should be given to relating Basic Studies subjects as well as Social Studies and Humanities subjects more explicitly to their application to architecture, and to indigenising subject content in the Building Technology area so that its is relevant to, for example, the materials that are actually used in the Saudi building industry. To some extent this is a matter of teaching approach (See below).

It is also recommended that a general overhaul of the curriculum structure should take place, with particular regard being given to the greater integration of subjects within the curriculum. The position of design needs special attention, both in regard to its relation to other subjects and in regard to the way it tends to be conceptualised within architecture schools. Support subjects should be directly and systematically related to design within the design studio so that students could apply in design studio work, including their design projects, the knowledge they gain about other architecture subjects. This, of course, touches on teaching method (which is discussed below) and it may mean greater deployment of support subject teachers within the studio. It is recommended that more emphasis should be given to the practical realisation of the product of design - the building - and less to its theoretical and aesthetic aspects.

Curriculum integration would also be improved if it were restructured so that subjects were taught in a more logical sequence, and such a move is recommended. Students would not, then, learn about a subject in one year and not have to apply it to design work until two or three years later.

The problem of the inability of new architecture graduates to deal with such daily office matters as finance, client relations, and administration has been to a some extent dealt with in the recommendations about effective practical training (above). However, it is also recommended that thought be applied to more extensive professional practice and management education within the schools. Consideration should be given to a bilateral approach whereby the clear weakness of new graduates in this area is addressed by both effective practical training and more thorough school instruction. Such a recommendation is, of course, linked to questions about teachers' isolation from practice (See below).

It is further recommended that the curriculum should allow more elective courses to be offered. This would allow architecture students to develop specialist and research interests and would enable many to find careers in architecture-related areas outside mainstream architectural practice.

The matter of electives is related to course duration and the credit hour system. We have seen that it is widely agreed that it is impracticable to extend the course duration, but the recommendation is made that an overhaul of the credit hour system should be considered in order to allow for greater flexibility within the five-year duration of the programme.

Teaching and the position of teachers within Saudi architecture schools requires some attention. It is recommended that a review should take place of the regulations preventing teachers from practising and practitioners from teaching. We have seen that this isolation of teachers from practice is one of the factors highlighted most often by interview respondents when they comment on the gap between education and practice. A change in this situation would help to bring about a transformation in the relationship between education and practice. Consideration might also be given to the career path by which individuals become architecture teachers in the schools. If it were possible to recruit capable persons to the academic teaching of architecture from within the architecture profession, then of course this would help to close the education/practice gap, as these teachers would be aware from their own personal experience of the day-to-day realities of architectural work. Furthermore, the very fact that teachers were known to have had experience of practice would mean that the respect and attention they received from students would be greater.

A further recommendation is intended to deal with teaching approach and technique. It is that teachers should, as far as possible, have some form of training as teachers. It may not prove practicable to produce individuals who are trained both in architecture schools and in teacher training colleges, but the universities should give some thought to the setting up at least of in-house training for university teaching staff, where they would be introduced to the basics of educational psychology. The researcher is aware than architecture teachers are already under pressure from credit hour requirements, numbers of students, and administrative duties. Nevertheless, the recommendation is that thought should be given to finding a way to introduce some teacher training. An outline of the basics of educational psychology, with an emphasis on integrated learning techniques, is provided in Appendix VI. Of particular note is the fact that the model of learning presented has some parallels with what many interview respondents see as the ideal model for curriculum integration in architecture schools.

Teachers, whether as a result of training in instruction techniques or not, should be encouraged to make use of more stimulating teaching techniques such as site visits and workshop sessions.

A re-direction of funding available to architecture schools in Saudi Arabia would also be a help in teaching, and it is therefore recommended. We have seen that libraries and other academic support resources are often under-stocked or under-used. Given the amount of financial aid that has been put into education resources, it is recommended that a review of the use and administration of this aid should take place. Well-stocked libraries and labs, and workshops that are more available for use, would not only increase the amount a student can find out for himself, but would make it easier for architecture school teachers to utilise more effective teaching approaches and to achieve curriculum integration.

Although it is linked to the amount of material on architecture available in books and journals, thought should be given to the greater or even exclusive use of Arabic as a teaching medium. This would make for more effective learning, which of course would contribute to the reduction of the education/practice gap.

It should be stressed again that in making these recommendations the researcher is well aware that their implementation might be no easy matter. But he has not made any recommendations which are beyond realistic possibility, and the main concern at this stage is that consideration and informed discussion about the recommendations should take place.

At the same time, it should also be noted that the recommendations are not to be seen as isolated steps which may be taken independently of each other. Small individual measures here and there might indeed be viable, but the recommendations depend on a fundamental willingness not only to recognise the problems of architecture and architectural education in Saudi Arabia, but also to recognise the potential for change on a larger scale. In particular the execution of a great many of the recommendations hangs on the prior implementation of the main recommendation: the establishment of an effective professional architecture association in Saudi Arabia. So much else depends on that, as it is through an effective professional body that the researcher envisages the guidance and impetus for change emerging, and the control of both architecture and architectural education being exercised.

It is to the most effective way to achieve this step that future discussion must now direct itself.

9.5 Summary

This chapter has brought together the various strands involved in the study, presenting the research findings and making the researcher's recommendations.

Following an outline of the thesis chapters, the conclusions regarding the causes of the gap between architectural education and practice are set out. For convenience these are grouped into causes within education and causes within practice, though it is one of the findings of this study that such a neatly exclusive allocation of causes to one category or the other may not always be justifiable.

Causes with education include the fact that teachers are isolated from practice because Saudi teachers are not permitted to practise and non-Saudi teachers, though they tend to have had practical experience, are unfamiliar with Saudi culture. They also include the fact that the architecture curriculum suffers from lack of integration between support subjects and the design studio, and the fact that the abstract concept of design with which students are imbued in architecture school is far removed from design in relation to the building process. Other causes of the gap within education include the fact that much of the subject content seems irrelevant, either because of the lack of integration we have noted, or because the Saudi architecture curriculum is to some extent imported and not appropriate for Saudi needs. Poor curriculum management, the short course duration, the credit hour system, poor curriculum delivery (exacerbated by the fact that teachers are not trained), and inadequate or under-used library and other academic support resources are also at fault. Though it may not be strictly accurate to call it a cause within education, the lack of proper practical training is also a major cause of the education/practice gap.

Causes within practice may all be characterised as manifestations of the fact that practice is not properly organised. The single most readily identifiable cause is the fact that there is no effective professional association, and all the other causes of the gap within practice relate to this, since an effective body would deal with the other causes. These other causes include the fact that practice has no set of codes or standards that it follows consistently, so that it does not present education with anything to aim at. There are few building laws or regulations within architectural practice for schools to follow in training students. A further aspect of the lack of the organisation of practice, and a further cause of the education/practice gap, is the fact that there is no regulation of who can practise architecture or who can designate himself an architect. Lack of a proper registration procedure, including an examination, means again no norms to follow for education.

In the light of these research findings, the researcher makes several recommendations.

Of primary importance he recommends the establishment of an effective professional body, as this would have a an effect on many other causes of the education/practice gap. Other recommendations include consideration of the institution of proper registration procedures, including the registration of the title 'architect' and the holding of professional examinations, and comprehensive building standards, codes, and regulations. A properly organised period of practical training is also recommended, as are various aspects of architectural education. These include the following. Art or craft-related classes should be introduced into the nation's schools, and the entire curriculum ethos in schools, with its stress on passing exams, should be reconsidered. Architecture schools should accept students from a wider variety of backgrounds, especially craft or trade backgrounds, and screening of potential students is recommended. Architecture schools should state their aims more clearly, and should give more thought to curriculum management and structure, especially to the integration of subjects. Particular attention to the position of design, to Professional Practice subjects, to the possibility of electives, and to the elimination of 'imported' curriculum material should be given. It is also recommended regarding teachers that teachers might be permitted to practise architecture, and that there should be training in teaching approach and techniques for architecture school teachers in order to improve curriculum delivery. A redirection in architecture school funding is recommended, so that academic support facilities and opportunities for their use may be improved.

It is recognised that an integrated approach to the implementation of recommendations is required, as isolated steps will not improve the overall position or close the education/practice gap.

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APPENDICES

APPENDIX I

INTERVIEWS WITH TEACHERS

Interview 1

Bahammam, Ali Salim

King Saud University

Researcher: *Can you give me some information about your educational background?*

Bahammam: I graduated B.Arch. from Riyadh (now King Saud) University in 1980. I trained at the School of Architecture, which was associated with the College of Engineering. I gained my Master's degree from McGill University, Montreal, Canada, in 1987. I was awarded my Ph.D. from Ann Arbor University, Michigan, in 1992. Now I have been teaching in King Saud University for seven years.

Researcher: *Do you practise architecture?*

Bahammam: No, I don't practise, since I am mostly involved in teaching. However, when relatives or friends ask me to do some work for them, I do so to oblige them.

Researcher: *In your opinion do you think there is a gap between architectural education and practice in Saudi Arabia, and if so, how does this show in the student's performance after graduating and beginning work?*

Bahammam: Before I answer your question I would like to ask <u>you</u> a question. You implied that there are some inadequacies in the student's performance after graduation. Can you explain this to me?

Researcher: *After carrying out interviews with practitioners from both private practices and government agencies, I found out that the architect, after graduation, is involved either in design, site supervision, or management work. When we look at site supervision, for example, the school does not prepare the student for this, although it is an integral part of his work after graduation. And then there is the issue of design. Although this is the main focus of the school's training, there are some shortcomings in this field too. Although the design element of the course is structured to take the student through the design process, from the first meeting with the client to the completion of the project, nevertheless the newly trained architect finds that he has not been fully prepared for the procedures involved in meeting clients, drawing up contracts, architectural programming, site analysis, building economics, costs and budgeting, technical work involving drawing and detailing, project presentation, and bills of quantities and specifications. Regarding management work, interviewees working in the government sector have emphasised that there are shortcomings in, for example, managing, and writing reports about existing buildings.*

Bahammam: The student is not required to be competent in all these aspects. The student goes through a process of learning, and I can assure you that, even if the duration of training became longer, the student would not become more competent. By the time of graduation, every student has some strengths and some weaknesses; some students are good in design, others good in working drawings, for example.

Researcher: *Speaking of these individual strengths and weaknesses, I am concerned about how the architectural course responds to the interests of the students. Some students may* *have an interest in design, for example, others an aptitude for technical drawing or administration, and so on. In some other countries, for instance in the USA and the UK, they try to foster this by offering elective courses, so that a student may specialise in a field of particular interest. However, in Saudi Arabia all students must follow exactly the same course. Do you have any comments on that?*

Bahammam: In the past we used to have elective courses; now we don't. What we do now is offer the student the facility to specialise in either design or building science in his final year, although we offer only four extra courses in these fields. This cannot give the student full flexibility, but it is a step in the right direction. Of course our graduates have shortcomings and weaknesses, as we can see when we look at architectural practice in Saudi Arabia. They are expected to work as fully-fledged architects right away, without being exposed to the market realities and requirements in any further trainee capacity. For example in the USA and the UK the student is required to do a period of practical training in an architectural office for not less than three and two years respectively. So I think that the problem is not with the school's academic training, but with the failure of the architectural profession to require further practical training and a licensing examination.

When comparing architectural education in Saudi Arabia with architectural education elsewhere, we have to consider one important factor, and that is the nature of the surrounding built environment. In Saudi Arabia, unlike some other countries, there is no richness in the architectural environment immediately to hand to be observed in the cities. Traditional buildings have generally been demolished for development, and most of the contemporary buildings offer poor examples to imitate. So the students, while studying at the School of Architecture, develop almost a schizophrenic mentality. They are asked to produce good designs, but they see only bad examples!

Researcher: *What is your opinion of the buildings currently being produced in Saudi Arabia, from the point of view of aesthetics, function, structure, and so on?*

Bahammam: I can answer your question best with reference to dwelling houses, since it is houses that Saudi architects mostly design. Other buildings, such as public buildings, tend to be designed by overseas architects or by big local firms largely employing overseas architects. Aesthetically most of the dwelling houses lack aesthetic merit - in short, they are ugly! Functionally most of the houses I have seen display great waste of space, and the relationships between the internal house spaces are not always well thought-out. In some cases, for example, the kitchen is located a long way from the dining area. In another example I saw living rooms without windows, or any openings whatsoever, and depending entirely on artificial light.

Structurally there is often unnecessary over-use of structural elements, such as columns and beams, which in many cases are simply larger than required. Sometimes this factor is attributed to other reasons than the incompetence of the architect. In Saudi Arabia the building authorities will not pursue an architect if a building is ugly, or it displays poor use of internal spaces, but will pursue him if the building falls down. Thus, some architects make doubly sure that they will not suffer this fate by making supporting structures larger than they need to be. For example, I myself was guilty of doing that after graduation when I opened an office with some of my friends, but I changed my conception about structure after studying in Mexico City and in the USA. There I saw some buildings of three storeys in height, even in earthquake areas, without any supporting reinforced concrete columns. They had only interlock concrete blocks reinforced with steel.

Researcher: *In your opinion, what are the causes of this gulf between architectural education and practice?*

Bahammam: The teacher. The university always chooses the students who have achieved the highest grades in their degrees to go abroad and complete a Ph.D., with a view to becoming university teachers. However, the highest grade does not always mean the best teacher. For example, a student with low grades in the design element of his course, but with high grades in other subjects, may have high overall grading and a good degree. He may well be elected, on that basis, to a university teaching post where he may have to teach design, where a student with a lower overall degree rating, though with better grades in design, may be overlooked.

There is also the question of the student. Nowadays universities accept a greater number of students than before, which has reduced the overall quality of the training, as this puts more pressure on the teaching staff, who cannot cope so well with such large numbers. Furthermore the morale of students is lower than it was before. Ten or fifteen years ago students could look forward with confidence to securing a good job with a considerable salary, since architects were fewer in number and their services were much in demand in the community. The architectural profession was rewarding, financially, psychologically, and socially. Students, therefore, displayed high morale and were ambitious to achieve the best possible grades. Nowadays, however, the job market offers fewer opportunities, and this has had the effect of lowering the morale of architecture students. Students are not persuaded that high grades will mean that they will get a job in any case, so that they are less concerned to make an effort in this respect. They are concerned simply with passing. This has meant a lower overall quality of graduate.

Interview 2

Fadan, Yosef

King Saud University

Researcher: *Can you give me some information about your educational background?*

Fadan: I got my B.Arch. from Riyadh (now King Saud) University. I gained my Ph.D. from MIT in 1983, and I have been a university teacher for fifteen years.

Researcher: *It is said that there is a gap between architectural education and practice. How does this gap effect the training of students?*

Fadan: The cause of the problem is that there is a gulf between teachers and practitioners. On the one hand architecture teachers in Saudi Arabia do not practise architecture. Practitioners, on the other hand, are not invited to teach at the university. Practitioners' involvement with the schools of architecture in Saudi Arabia is limited to participation as members of the jury for final year projects. Another cause of the problem is that the students are taught only the theory of certain disciplines without any practical content. In other words, they are taught on the blackboard, not in the design studio. The result is that they do not know how to apply the theory in practice.

Researcher: *From your experience of working with students, what do you think is the effect of this gap on the training they receive?*

Fadan: After the student graduates, his training is not complete. One sign of this is that the student takes a year or two familiarise himself with the day-to-day practicalities of architecture. Another cause of the problem is that the summer training required of a student before graduation [which is eight weeks at the most] is simply not long enough.

Researcher: *I would like to ask you about specific tasks which architects carry out, and to ask how well your students are prepared to perform them. These tasks were amongst those most frequently mentioned in interviews with architectural practitioners. Firstly, project management.*

Fadan: This issue is not covered in the curriculum. Here in the School we believe this task should be learned only after a student has graduated.

Researcher: *Second, architecture programming.*

Fadan: This is an important part of the training of the architect, and the curriculum covers this quite fully. I think the student is well prepared for this task.

Researcher: *The third thing I want to ask about is feasibility studies.*

Fadan: This is an important aspect of the training of the architect. We teach the student this subject only theoretically, and the students are not required to apply the knowledge they gain in this subject in their work in the design studio.

Researcher: *Working drawing.*

Fadan: I don't teach this subject, but as far as I know the training the students receive in this is not enough, and there ought to be an emphasis on this subject because it is an important aspect of an architect's work.

Researcher: What about site supervision?

Fadan: Though this is part of the architect's work after graduation, this is not covered at all in the curriculum. I think that students should be required to cover this during their summer training.

Researcher: And project presentation?

Fadan: Unfortunately we do not place any emphasis on training the student to present his work orally to a potential client. The failure to do this properly can be seen when students present their projects to the jury for assessment. Many students are concerned to show that their work is the best, or indeed the only possible, solution to the problem. In practice, however, an architect has to be less defensive in the real world, and more concerned with selling his services persuasively to potential clients.

Researcher: Do you have any comments you want to add?

Fadan: I feel that students now are of lower quality than before, because the curriculum contains too many subjects. The result is that the student has to concentrate on some subjects at the expense of others.

Researcher: What do you think are the causes of this gap between architectural training and practice? The teacher, for example?

Fadan: Yes. Teachers of architecture are not practising architects. They do not, therefore, have any practical experience of an architect's work to transmit to the students. The teacher should be allowed to practise in order to gain the required knowledge of the day-to-day work of an architect, in order to transmit it to students.

Researcher: How about teaching methods?

Fadan: Teaching method is very important for the transmission of knowledge from the teacher to the student. Teachers of architecture in Saudi Arabia go abroad to take Master's degrees and Ph.D.s after completing their B.Arch. They then come back and enter university teaching. At no stage do they themselves ever undertake any training in teaching or teaching methods, and they may often therefore be unaware of the best way to achieve results with their teaching.

Researcher: How good is the physical academic environment in your School of Architecture?

Fadan: This is very important for the education of architects. Unfortunately this environment has some shortcomings in my school. The library stock, for example, is inadequate. The journals are all out of date because we no longer subscribe to the ones we used to, and there is no new stock of books arriving. The last new book we took is now five years old. The only way that even the teaching staff can keep themselves up to date is to buy new books themselves. The students, therefore, do not have access to an up-to-date library, and they are always behind.

As for the labs, they are not fully utilised because, as far as I know, the teachers do not encourage their students to use them, and by that I mean that the labs are not incorporated in the teaching methods of the subjects. The subjects ought to be taught practically, but instead they are only taught theoretically. For example, Structural Analysis is taught on the blackboard, whereas it should be taught in the structural lab. Further, building science matters like heat insulation, sound, etc. are also simply taught in the classroom, where they should be taught in the labs.

Researcher: *How about the role of the professional bodies?*

Fadan: In practical terms these bodies play no role at all in Saudi Arabia. There should be professional associations exercising a controlling role over two factors - practice and education. All the architectural training programmes in the country should be reviewed, evaluated, and accredited by the professional bodies.

Researcher: *At the end of this interview, do you have comments you would like to add?*

Fadan: All the requirements for the training of architects are in the curriculum. The problem, as I see it, is not with the curriculum content, but with the delivery of that content. The School of Architecture is not concerned with what goes on in practice. For example, when the curriculum is being devised, they don't go and observe what is happening in architectural practice, and then design the curriculum to reflect this. One obvious example is that we teach Archicad, while the market uses Autocad. There is a circle which should always be complete, and it goes from the market to the university and then back to the market, but in fact it is not like this. The individual subjects should feed into the design studio like rivers feed into a lake, but in fact the students do not have the skills to apply in the studio the knowledge they get in their courses. For instance, the students are unable to grasp the economic realities, the real costs, involved in the design projects they produce. They do not know how to design to a fixed budget, even when designing their graduation projects.

Interview 3

Ghamadi, Mohammed

King Saud University

Researcher: ***Can you tell me something about your educational background?***

Ghamadi: Currently I am an Assistant Professor at King Saud University. I gained my B.Arch. from King Saud University School of Architecture, and my Master's degree and Ph.D. from the University of Newcastle upon Tyne.

Researcher: ***In your view is there a gap between architectural education and practice in Saudi Arabia?***

Ghamadi: Yes, although it must be remembered that the architectural profession is relatively new in Saudi Arabia, compared to other countries; it is barely thirty years old. So the requirements of architectural practice have not been fully studied yet. That is why architectural education does not reflect the realities of architectural practice.

Researcher: ***Are there any other factors which contribute to this gap?***

Ghamadi: One problem of architectural education in Saudi Arabia is that the teachers of architecture do not practise architecture, and practitioners do not teach. The duration of the summer practical training is merely eight weeks, and this is not enough. Furthermore, the schools make no attempt to observe the students while they are doing their practical training.

Researcher: ***You have mentioned the teachers, but how about the teaching methods?***

Ghamadi: In architectural education the one-to-one relationship between the teacher and the student is really important. It is more like a tutoring than a teaching situation. The relationship between the numbers of the students and the quality of the education in architectural training is an inverse correlation, in that the quality of the teaching delivered decreases in relation to the increase in the numbers of students to be taught. The teacher-student ratio here is one to thirty, which is very high.

Moreover, within the School there is an emphasis on individuality; each student works on his own on his project throughout the period of his training. But architectural practice is by nature a matter of teamwork. Within the Department, within the College, and indeed within the University as a whole there is a lack of awareness that professionals from various disciplines must work as a team.

Researcher: ***This seems to point to some curriculum issues.***

Ghamadi: I agree. Within the Department structural subjects are taught separately from mechanical, electrical, and building science subjects, so that they do not integrate holistically, and this has negative results. Similarly within the College, there are other fields such as Landscape Architecture, Town Planning, and so on, and within the wider University, there are disciplines which are relevant to architecture, such as Structural Engineering, Electrical Engineering, Mechanical Engineering, and so on. There is no co-operation between these various disciplines, no working together on projects, though this is what has to happens in practice in a professional context after the student has graduated. There should be a system whereby, at least for one project, students from these various disciplines should be brought together to work as a team so that they can see what the relationship is between their own subject and other disciplines, and would learn how to work together as a team.

Researcher: *How about the design studio?*

Ghamadi: It is important that the subjects taught in the course should feed into the design studio, but this does not happen in Saudi Arabia. During my period in Newcastle I noticed that all the subjects do feed into the studio, and that the students apply the knowledge they gain in the classroom to their work in the design studio. Students are asked to show that they have understood what they have been taught in the classroom, by writing reports or producing technical drawings relating to their studio work. Here, in our school of architecture, the structural courses are taught as a separate discipline, and the students are not asked to demonstrate that they have understood, and to apply their knowledge in the design studio. I suggest that Structure should in fact be taught in the design studio, and that when a student is asked to design a project the structural teacher should teach him how to design the specific structure of that project. In any architectural practice there is an integration between the design of a given project and its structural, mechanical, electrical, and plumbing aspects. In fact, however, these things are taught separately in classrooms, and they are not integrated in the design studio. So that is why the work in the design studio has a negative aspect; there is an emphasis only on the function of the floor plans. The practicalities, then, are not covered and the form of the building is not well-conceived. The student tends to think of his project as only two-dimensional, not as a form, as a concept, or as a philosophy.

Most of the students spend their time designing floor plans, and trying to solve problems related to floor plans. They draw the elevation in the final week because it is a requirement. Often the appearance of a project at the floor plan level is very impressive, but what are missing are the practicalities of cost, structural requirements, and so on. In practice, however, these latter things make up about sixty percent of the work. A project might, therefore, seem worthy of an 'A' grade in school, but would only get an 'F' in practice! However, we don't see this reflected in the architecture curriculum.

Interview 4

Haikal, Namir

King Saud University

Researcher: ***Can you give me some information about your educational background?***

Haikal: I gained my B.Arch. from the University of Asyut, and then from the Beaux Art in France. I have taught in three universities in Egypt, and established the Department of Architecture in the University of Jordan and the Architecture Department in the University of Yemen. Now I am Full Professor at King Saud University. I teach Design, and History and Theory of Architecture.

Researcher: ***In your opinion is there a gap between architectural education and practice in Saudi Arabia?***

Haikal: Between practitioners and teachers there is always a degree of discord. One group possesses the knowledge, the other carries out the practice, and there is no integration between the two. This gap has been widened because in Saudi Arabia teachers do not practise and practitioners do not teach. In Arab society university teachers still have more status than architects. Architectural practitioners are regarded as tradesmen rather than professionals, and are not accorded the same prestige as teachers, which increases the discord between them. In Egypt teachers of architecture also practise architecture, so that the gulf between the two groups is smaller.

Researcher: ***I have been told during my field trip visit to Egypt that Egyptian architecture teachers, even though they may carry out all the day-to-day tasks of an architect while working in an architectural practice, revert to dealing purely with formal and aesthetic matters as soon as they return to their teaching roles. Is this the case?***

Haikal: I don't think this is a problem. Because he is also a practitioner, the teacher will never forget the day-to-day aspects of architectural practice, and he transmits this to his students in his teaching. What he is doing in emphasising the formal and aesthetic aspects of architecture is allowing the student to exercise his creative imagination. There are constraints on such creative imagination in architectural practice, and his period in training may be the only opportunity that a student gets to exercise his powers in this way.

Researcher: ***Is there a gap between architectural education and practice, and if so, how does this show in the student's performance after graduating and beginning work?***

Haikal: The relationship between architectural education and practice in Saudi Arabia is almost non-existent. In our School the only element of co-operation between training and practice is that we invite architecture practitioners to be members of the juries which assess students' final projects. We can see the differences between the approaches of teachers and practitioners when these juries discuss the projects with the students. The teachers talk about the philosophy, the theory, the form, the concept, the symbol, etc. of the designs, whereas the practitioners speak about the practicalities, such as building laws, costs, structure, and so on. So the student comes into contact with practitioners only on such occasions, which are three times in a semester, three hours each jury, a total of nine hours. The rest of the semester students spend only with teachers, who by law cannot practise architecture.

Researcher: ***Students have expressed to me the view that they feel alienated from the practice of architecture while they are in the design studio. One student says that he draws a line*** *on the paper, but he does not know how to build this line. Another states that he does not have a sense of the structural problems of the design. Yet another says that, while he is designing, he does not take into consideration the knowledge he gained in the building science courses, such as heat and ventilation. He does not know how these things should be reflected in his design. The same student comments that the school emphasises only the social and aesthetic aspects of architecture.*

Haikal: I am going to answer a question similar to your question, which will help me answer your question. That is the question of the relationship of the theoretical course and its application. The architecture curriculum in King Saud University is arranged such that the design studio is the centre of the curriculum, which all the other subjects should feed into. The design studio is where the student should learn how to think about architectural problems and how to handle them as an architect. To help him accomplish this task, the curriculum offers a group of courses on topics such as history and theory, building science, economics, professional practice, etc. It is supposed that these courses should feed into the design studio, which is for one reason or another a mission which is not accomplished. If we manage to link the theoretical courses in a relevant way with the design studio this gap will be reduced. I, for example, teach the course of History and Theory. I try to teach the student how to utilise history in his design. In fact I teach the course in the design studio. The materials I use in the course are relevant to the project the student is designing. For example, I give the student references from history to the same problem as the one which he is now facing in the design studio, and show how this problem has been tackled in the past.

Researcher: *You mentioned in your response that the theoretical courses are not linked to the design studio. Why is this the case?*

Haikal: In answering this question I will be very candid and straightforward with you. We are supposed to look upon the School of Architectural Education as a school of thought that has a direction and a trend that it tries to follow. It is supposed, furthermore, that the person who manages this curriculum is like the coach of a football team or the conductor of an orchestra, and this manager should understand fully the process of education. So each teacher should work and co-operate with the other teachers as if they are in a team, and each member of the team has a role to play in reaching the objectives of the school. What is actually happening now is that each teacher is acting on his own in complete isolation from the others. No teacher can teach structure in isolation from what is going on in the design project. The head of the School, the Chairman of the Department of Architecture, is the one who is supposed to lead the team and find the chemistry between the members of his team.

Today the student cannot find a link between the different subjects of the curriculum and the design studio because the course content and the delivery of the courses by the teachers are not explicitly linked together. So on the one hand the teachers do not co-operate with each other, and on the other hand the Chairman does not have the ability to lead them. Curriculum management is really the problem. In my opinion the curriculum is excellent, but the way in which it is delivered is inadequate. In the USA, for example, when a school to seeks to appoint a new dean, a committee is formed to make the choice. After his appointment, the new dean then brings in other players to form his team, and they sit down together and discuss the objectives of the school and the best way to achieve them.

Researcher: *How about Studio 7? Is it not meant to integrate the various elements in the course?*

Haikal: Yes, true. Studio 7, which is the name given to the System Design Studio, tries to link all the systems with the project design - the right structural system, the right mechanical system, the right electrical system, and so on - so that we can see the integration between the design and the different systems. And the students tell me that this is the best course they undertake in the duration of their study.

Researcher: *Why are the students not asked to apply building codes and regulations in their projects?*

Haikal: I will tell you what I think, and I am sure this is the opinion of other teachers. Frankly, we don't trust these codes and regulations, and we are not convinced that they are correct. So we do not like to teach them as a constraint on design. In fact these codes and regulations are superficial. There isn't much to teach anyway. There is no building law other than height and setback regulations, which have had a negative impact on the built environment.

Researcher: *In the course of my fieldwork I have conducted interviews with personnel from various government agencies, such as the Ministry of Housing and Public Works, the Ministry of Municipalities and Rural Affairs, and the municipalities of the major cities.*

They have told me that schools of architecture in Saudi Arabia place great emphasis on the function of the architect as designer, and the leader of the building team, where in fact design forms a small percentage of the function of the architect in practice. The major part of his work has to do with other services related to the building industry, such as site supervision, working drawing, etc.

One architect[38], employed at the Ministry of Housing and Public Works, told me that he was asked after he had been about three or four months in the post to inspect a building and sign for the handing over of the building from the builder. He had to tell his boss that he did not know how to carry out such an inspection, which was a surprise to his boss, as he had assumed he had been taught how to do this in his architectural training.

Another architect[39] told me that after he started to work his office wished to build a fence round a section of their property, and he was asked, as an architect, to design and write the specification of this fence. Although this was a small job, he did not know how to do it. He was embarrassed to admit this to his boss as he was just new in the post. He had therefore to go to a private practice in the city to ask them to teach him how to write the fence specification, a service he paid for out of his own pocket. At the time he felt angry with this experience, and felt that he had been misled by the architecture school. He decided to re-educate himself in the practicalities of architecture, which the school had not prepared him for.

Haikal: In answering this question I have to very clear and practical. Architectural education is supposed to parallel education in other professions. Medical training in Saudi Arabia, for example, lasts about seven or eight years, and architectural training in other countries generally lasts for about the same period of time. But the average duration of an architect's training in Saudi Arabia is four to five years. This limited duration does not allow the school to teach the student every aspect of architecture, so that there has to

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[38]Ibrahim Nwaeser, employed at the General Directorate of Design, Deputy Ministry of Housing, Ministry of Housing and Public Works.

[39] Mohammed Luhabi, employed at the Directorate of Design and Construction, Ministry of Interior.

be an emphasis given to one or other aspect of it. The schools have decided to put the emphasis on design. In this School we try to instil in the student the ability to learn and think as an architect, and to deal with design problems after graduation. After graduation the student really ought to train for at least three years and then take a licensing examination before being admitted to practice.

Researcher: *Why can't you make the duration of training in this country longer?*

Haikal: If we make it any longer the student will not see it as rewarding to become an architect.

Researcher: *I would like to ask you about specific tasks which architects carry out, and to ask how well your students are prepared for the performance of them. These tasks were amongst those most frequently mentioned in interviews with architectural practitioners. Firstly, project management.*

Haikal: Project management. I don't think that this issue is covered in the curriculum and I don't think that the student is well prepared to handle it. Some teachers, I believe, think that this is more a matter of business administration than the work of an architect.

Researcher: *What about architectural programming?*

Haikal: This aspect is covered one hundred percent.

Researcher: *I want to ask you about the various subject groupings within the curriculum. Firstly the cultural context, such as the history and theory of architecture.*

Haikal: This is the area which receives the least adequate coverage in the curriculum, although it is supposed to be of the greatest importance, since this is where we can teach the student how to think. To be an architect you have to think right, and an architect should know about the social context of the environment and how it relates to his work.

Researcher: *About the history and theory of architecture, during my field trip a student told me that the history and theory content had no relevance to his work nowadays. One student commented that he could not see the value of learning how the pyramids were built or the difference between a Greek temple and a Roman one.*

Haikal: Your question is directly related to history and how it is taught. Most history teachers teach it as a stylistic development of style over the years, without trying to explain the underlying ideas and principles behind the style. That is why the student cannot see the value of the course.

Researcher: *How about visual communication skills?*

Haikal: We are now following in our curriculum methods that used to be used in Beaux Art and Bauhaus sixty or seventy years ago, such as the perspective from the Beaux Art and the basic design from the Bauhaus. We teach these things as they are without thinking about the environment and the culture of the region. This has two flaws. The first one is that we have not used these techniques selectively, taking and using the elements which were best suited to us. The second flaw is that when we imported these traditions we did not bother to develop them. For example, why don't we teach our students how to communicate properly, so that they can present their work most effectively to potential clients? Why don't we teach our students report-writing skills? I always ask my students to write a two-page report about their final project, but unfortunately they cannot do this. It is not their fault; it is the fault of the system.

The main question is, what are the basic requirements which a student needs in his future career? Are they the freehand skills and the technical drawing skills which we are teaching him now, or could it possibly be something else? I don't know the answer, but what I am sure of is that we need to forget the Beaux Art, to forget the Bauhaus, and start from here.

Researcher: *What about building technology?*

Haikal: Still we are teaching Mitchell and McKay, wood construction, and details that are not used here. Go to any graduate and ask him to draw a cross-section in a marble floor. I assure he doesn't know how to do this, because he was not trained to do it. Instead he was taught to draw details of the queen post and the king post, and ever since the subject of Construction was introduced to the curriculum it has never been developed, and it has never been indigenous.

Researcher: *Why don't you teach The General Specification of Buildings, which was published by the Ministry of Housing and Public Works, in your School?*

Haikal: God Knows!

Researcher: *Now we have established that there is indeed a gap between architectural education and practice in Saudi Arabia, could you now perhaps discuss the causes of this gap, for example the teacher?*

Haikal: Ever since Mohammed Ali Basha we have been sending students abroad to gain knowledge and return with it. There are schools in Europe which say: 'You have graduates at the highest level possible from our schools. You are supposed to have schools like us, and even better. We have educated people from your countries and sent them back to you. Where are they?' And still we are sending our students abroad to gain knowledge and return with it. Our School ought to be a local research school. Without a research school we cannot develop the practice, the training, and the profession as a whole.

In Egypt, students are not now allowed to do a Master's degree abroad; they have to do their Master's research within the country before they are permitted to go abroad to gain a Ph.D. In this research they tackle local problems. Another point about Egyptian universities is that there are open channels between them and universities abroad, so that a student can register for a Ph.D. in an Egyptian university initially and work there for a year or two, and then go abroad for a year, to collect material for the literature review for instance. He then returns to Egypt for final submission and the doctorate, if awarded, is from his home university. This entails having two supervisors, one in Egypt and one abroad, and both will have some input into the final assessment and award of the degree.

One of the bridges between architectural education and practice is that large architectural firms come to the Saudi Arabia and carry out large projects. The student should benefit from these experiences. It could perhaps be stipulated in the contract that five students, for instance, could be sent abroad to the head office of the firm to see how the project is designed, another five or ten could train on the site during the construction of the project. A multi-million dollar high-tech high rise building is being built here in

Riyadh by Sir Norman Foster, and nobody is benefiting from the experience of its design or construction.

Researcher: *How about teaching methods?*

Haikal: As problematic as that is, the real disaster is that we do not have reference materials. Even if the teacher has an excellent teaching method, but the student misses the lecture or couldn't understand it, he in no way can go back to any reference source to get the lecture. The student should have access to the lecture. We should have an information centre in the School where every lecture is documented with all the connected audio-visual material made available.

Another way of helping the student through improved teaching methods is that we should have in the School of Architecture a database of all the quality buildings built or under construction in Saudi Arabia and abroad, with plans, sections, and elevations for the student to access and study. There should also be another database for all the traditional architecture of Saudi Arabia and the Islamic world. Sometimes we tell the student of a case study of a building elsewhere that could help him understand the project he is working on, but there is no locally available material on it. Our age is all about communication and the information superhighway, and we should live up to our age or we will be left behind. These are the kinds of things which will help us improve the education of future architects.

Researcher: *How about the students?*

Haikal: The admission office of the University sends us every year an increasing number of students without proper understanding of what architecture is all about. Sometimes we get students who don't know the difference between architecture and civil engineering. I don't blame the student. I am one of those people who would like to revolutionise the whole of the education system in the Arab world. There is one thing that has weakened education in our country, and that is the great emphasis on examinations and grades as a teaching method. It has become such an obsession of students and their parents that students sometimes even cheat in order to get the highest grade possible. So the problem is that there is currently only one way of assessing the student, whereas we should have different ways of assessing a student. I suggest that the admission of the student should not in the first instance be to a specific School or Department. The first year at University should be a general orientation year for every student. During this time he can learn about study and research methods, how to use the library and the computer resources, how to write reports and assignments, and so on. He can also learn about the various courses and subjects which the University offers. After this, the student will be much better place to make an informed choice about the courses which interest him and which his aptitudes make him suited to.

Researcher: *How about the summer training?*

Haikal: The summer training is unorganised and its duration is too short compared to other countries. Here in King Saud University the student is required to train in an office for six weeks. This has no benefit for the student, and eliminating it altogether will not change anything, since the student will not learn anything in such a short period in any case. In the University of Jordan we tried something different. During the summer we allowed the student to design a room, with all the working drawing details and specifications, and to build it together with all the craftsmen and using all the materials involved. This was much more beneficial.

Researcher: *What about the role of the professional bodies?*

Haikal: The dilemma architectural education is going through in this country is that practice is not organised. There is no written code, specifications, or details specifically for Saudi Arabia. Anyone can import any building material from anywhere in the world, and a contractor can start using it, without contravening any regulations. Professional associations in Saudi Arabia have only a limited role. They have no power over either practice or education. The role of the Saudi Omran Society is to hold lectures from time to time.

Researcher: *How about the physical academic environment of your School of Architecture?*

Haikal: There is no standard text book in Arabic for the student to read. I am one of the people who are ready to write and translate books. The only hurdle in my way is that I cannot do all this with the teaching load I have. You cannot write and translate when you also have a twenty-hour per week teaching load, along with committees, administration, etc. Writing and translating should be a priority in the University, and it should free some teachers for this task, otherwise we will never have our own text books. The text books we are using now are in a language that the student cannot read and understand, and they lack the local perspective and are not relevant to the circumstances of the profession in Saudi Arabia.

Interview 5

Sulaiman, Tariq

King Saud University

Researcher: *Can you give me some information about your educational background?*

Sulaiman: I gained my B.Arch. from King Saud University, and then I went to America where I gained my Master's and Ph.D. degrees.

Researcher: *Is there a gap between architectural education and practice in Saudi Arabia and if so, what is the effect on the student?*

Sulaiman: In any system, in relation to any professional education anywhere in the world, there is a gap between training and practice. However, in Saudi Arabia the gap is wider between architectural education and practice than in other parts of the world. The reason, in my opinion, is that the students in other architectural education systems, especially in America and in Europe, take two years or more of practical training between graduation and registration as an architect. Architecture students in Saudi Arabia, on the other hand, are immediately absorbed into practice upon graduation without undertaking any practical experience. Immediately the student, when he is faced with the challenges of practice, loses confidence in himself. Also society, in turn, thinks that the student is a fully-fledged architect upon graduation. When they discover that he is not, they lose confidence in the architect. When we compare medical with architectural education here in Saudi Arabia we find that the medical student does one year's residency in a hospital prior to graduation in addition to the practical work he has done in the hospital during his period of study. Unfortunately our students do not take this dosage of practical training prior to graduation.

Researcher: *What are the causes of this gap, in your opinion? How about professional associations?*

Sulaiman: Both the Engineering Committee and the Saudi Omran Society have a willingness to change, but unfortunately they do have the authority to make the changes. The transition between architectural education and practice is lost here in Saudi Arabia.

Researcher: *Is it perhaps the curriculum?*

Sulaiman: I think our curriculum covers everything that ought to be covered. The problem is with the delivery of this curriculum.

Researcher: *Could you tell me about the summer training?*

Sulaiman: It is very short, and very weak, and I think our summer training does not help the student and it is not beneficial to him. For the student is only required to bring a letter signed and stampèd to state that he has done the course. We should have a structured practical training supervised by the schools, such as the one that colleges of education have where a member of the teacher staff goes and follows up on the trainee in the school, and they have a list of requirements that have to be covered in the teacher's practical training. When a teacher at a college of education is following up a student, then his teaching load is reduced accordingly.

Researcher: *Could you tell me more about the physical academic environment?*

Sulaiman: The library and the labs in King Saud University are very well equipped and regularly updated. I am very proud of the facilities we have here. We have all the labs that could aid in the delivery of the courses, but sometimes I feel that they are not very well used.

Researcher: *Speaking of that, why do you think the teachers do not use the labs, do not take the students to visit construction sites, and so on?*

Sulaiman: The reason for that, in my opinion, is the large number of credit hours that have to be put in, and the large amount of courses that have to be finished in a semester, and the load on the teachers and pressure on the students to complete them. A hundred and seventy-five credit hours is a lot for a five-year programme, and cannot be finished properly in that time. Unfortunately we cannot increase the number of years.

Researcher: *Why is that?*

Sulaiman: Because the students would not be rewarded for the extra year. Medical students, when they graduate, are employed at a higher rank. Also the job market is not very good at the moment, so that the student would like to graduate as quickly as possible to go and find a job. Also there is not a high enough regard from society for the quality of an architect's work.

Interview 6

Abdul-Baghi, Mustafa Hajj

Umm Al-Qura University

Researcher: *Can you give me some information about your educational background?*

Abdul-Baghi: I graduated B.Arch. from Khartoum University, and then I went to England where I got my Ph.D. I have been working in the School of Islamic Architecture since 1984. I was the Chairman of the Department from 1987 until 1989.

Researcher: *Is there a gulf between architectural education and practice?*

Abdul-Baghi: We were supposed to have a teaching office in the School where the student could learn the day-to-day business of architectural practice. But this has not happened because of the financial and administrative obstacles we faced. However, we have the Professional Practice Unit, where the students design projects for a real client and do all the working drawings for it. What is missing from this is that the students do not take into consideration the economic factors, such as how much the building will cost. In other words, they do not design to a limited budget. Also they do not do the bill of quantities and specifications. The student should do the details of the building specifications because this is the only way to link the student to the market, and for him to understand the different systems available in the market, and how they are sold and delivered. I mean things such as heat and sound insulation, and electrical and mechanical fixtures.

Another thing which is missing is that the student ends the process of design with the working drawing. He does not see what is going on in the actual building process and construction management. This is again a problem because site construction is not covered even by the summer training.

Researcher: *What is the effect of this gap on the student?*

Abdul-Baghi: The teachers do not practise architecture and they are distanced from practice. When I was a teacher at Khartoum University we had what is called a building unit, which was very similar to an architectural practice office. There we used to design the university buildings and do all the necessary working drawings, details and specifications, and contract bidding, and supervised the construction. The teachers used to work in this unit and we had a budget to employ structural engineers, and whatever other engineers the job required, and the students used to work with us in all aspects of the project from the initial design to the turning over of the building. This was beneficial for the students.

Interview 7

Barhamain, Sami

Umm Al-Qura University

Researcher: ***Could you give some information about your educational and professional background?***

Barhamain: I gained my B.Arch. and my Master's degree from King Fahad University. I worked then in the Hajj Research Centre when it was affiliated with King Abdul-Aziz University. When the Centre was moved to Umm Al-Qura University I became the Chairman of the Department of Architectural Studies. After that I went to Glasgow where I gained my Ph.D. Now I am working in the Centre as the Chairman of the Architectural Studies Department. I also teach a one-hour Professional Practice course to the students of architecture in the Department of Islamic Architecture.

Researcher: ***Do you think there is a gap between architectural education and practice?***

Barhamain: Yes, I think there is a gap between architectural education and practice, and you can see this gap manifest itself clearly in the work of the student in the design studio. There is no reflection of practical aspects of architecture on the work of the students in the design studio. It is difficult really to overcome this gap with the current situation, which exists by the way in almost all professions. But the gap with architectural education is much bigger, because such a huge leap forward has been made in the realm of building technology that the student cannot comprehend it in five years. Furthermore the economic considerations of our new society are not reflected in the work of the students in the design studio. It is also difficult to overcome this gap, because if you want to change the programme of architectural education it is a long process. By the time the new programme is approved it will be obsolete.

Researcher: ***How do you think this gap manifests itself in the performance of the student?***

Barhamain: As I told you the schools lay great emphasis on design. If a student is a good designer he is a good student; if he is a bad designer, then he is a bad student. And by design, they normally mean whether the floor plan works and what the form of the building is. But in reality an architect is much more than a designer. He also has to be an administrator, a site manager, a communicator, and so on. The schools of architecture should also teach the students about these aspects of an architect's work.

Researcher: ***What do you think are the causes of the problem?***

Barhamain: Also some of the teachers lack a proper teaching technique; Most of the teachers do not practise architecture, and this is the general weakness of most of the Departments of Architecture in Saudi Arabia. The teachers cannot put over the knowledge to the students.

Researcher: ***How about the curriculum?***

Barhamain: The theoretical framework of the curriculum in the Department of Islamic Architecture in Umm Al-Qura University is sound. There is however a deviation from the lines of the curriculum due to financial shortages and human resources, in the sense that there is no teacher who can understand the curriculum and deliver it. Also what has weakened our programme is that we are following the credit hour units that are not suitable for architectural education. Credit hour units tend to fragment the curriculum, so that, for example, Structure becomes a different subject, Building Science becomes a different subject, Design itself is treated as a separate subject, and they are not linked together.

Another shortcoming of the programme in Umm Al-Qura University is that there is no fixed syllabus for each subject, so that each teacher sets the syllabus himself. Thus, if a different teacher is teaching the same subject the following year, the students he teaches may in fact receive instruction on quite different things from the students who were taught by the other teacher. So there is a sense of discontinuity in the subjects. For example when I started to teach the Professional Practice course it was difficult because there was no syllabus for me to follow, or any indication of the educational objectives of the course. There were no guidelines. So I sat down and wrote out the content of the course, and when I compared it with the course taught by the previous instructor it was completely different.

Researcher: ***At the end of this interview do you have any comments you wish to add?***

Barhamain: At the Centre we have students from a number of different schools, and I can tell you that the students from Umm Al-Qura University are the best in the computer domain, such as CAD. I want also to tell you that the gap between architectural education and practice does exist; the question is how to reduce it. And I hope that you will emphasise in your research the needs of the market and how they should be reflected in architectural education, such as how building economics and social considerations should direct design.

Interview 8

Hariri, Majdi

Umm Al-Qura University

Researcher: *Can you give me some information about your educational background?*

Hariri: I gained my B.Arch. from King Saud University School of Architecture, and my Ph.D. from the University of Newcastle upon Tyne in 1987. I was the Director-General of Hajj Research Centre. Currently I am an Associate Professor of Architecture in the Department of Islamic Architecture in Umm Al-Qura University.

Researcher: ***Is there a gulf between architectural education and practice, and if so, how does this show in the student's performance after graduating and beginning work?***

Hariri: In the School of Islamic Architecture at Umm Al-Qura University when the curriculum was originally designed it was designed with the intention of reducing this gap. It was intended that architectural training should be carried out in the design studio and not through credit hour courses. It was designed in units, each academic year having two units, or sometimes just one unit. Each unit had a specific project for a student to design in the studio, and the project, as the students progressed, was to get more complicated. They would start with one simple room, and then progress through a small family house, an apartment block or student dormitory, a government building or other large-scale building, a housing project, and so on, until they reached their graduation project.

Each unit was to have a team of instructors, with the design studio instructor the leader of the team, and the team members drawn from different architecture disciplines such as structural engineering, building science, construction, mechanical and electrical engineering. And these teams were to teach the student within the studio, and to transmit to them only such information as was relevant to the project being undertaken. So the Department was supposed to show a new philosophy of architectural education, with many positive aspects. Also it was supposed to have the year before the graduation project as a one-year Professional Practice Unit. This was to be in an office set up in the School just like a professional practice office, where the student would work with the office staff, and get a live project from real clients. This office would have its own administration and budget like any other office. The student was supposed to learn the day-to-day practice of architecture in a real office environment.

However, this was a proposal only on paper and has never materialised. There were many obstacles that stood in the way of this proposal. At the beginning the subjects within each unit were altered to credit hour courses, so that Structure became a course by itself, Building Science became a course by itself, and so on, and there was no co-ordination between the subjects and the design studio. Also, there was not enough teaching staff to support the units. As for the proposed teaching office, there were financial and administrative obstacles that stood in the way of its creation. There was no financial support from the University for the setting up of the office, and administratively no one in the teaching staff was willing to take responsibility for the work produced by the office.

So now unfortunately there is a big gap between architectural education and practice, because there is no emphasis on practical training, and the four-week summer training is not adequate. Students just go through the motion of attending the office so that they can get the signed paper attesting that they have done so.

Researcher: *What is, in your opinion, the effect of this gap on the student?*

Hariri: Let me give you an example. I was once on a jury and the student drew a cross-section in a building, with all the details, and when I asked him about those details he had just drawn he told me he had copied them from an construction text book in order to satisfy the requirement. So sometimes the students produce the correct detailed drawings, but do not know how the process is actually carried out in practice, since they have simply copied them. The credit hour courses motivate the student only to pass the course exam; these courses have fragmented the holistic approach to architectural education into separate courses with no apparent connection between them. The student does not know where each course fits into the larger picture.

Researcher: *What is your opinion of the professional practice part of the course of study?*

Hariri: The Professional Practice Unit plays just a small part of the role that a full teaching office should play. The contact that they have with clients is artificial and stage-managed, quite unlike the way it would be in a real practice. Moreover, this Professional Practice Unit lacks the administrative and financial aspects of a real office, such as working to a budget. Also there is no consideration of the building costs. In the real world of practice building economics plays a paramount role, where in fact in the school the students do not take economic factors into consideration in any way whatsoever.

Researcher: *Doctor Saleh, who is responsible for the Professional Practice Unit, told me that in this unit they meet with real clients and do all the working drawing necessary for the project.*

Hariri: True, but all the clients are selected by the instructor and they meet once or twice during the progress of the design. It's not like real practice. Moreover the services of the Professional Practice Unit are all free, with no contracts involved between the school and the clients, and because of that it is not taken seriously by either the client or the student. If there is money involved then the client will seek particular demands, and the student and the office will have to work hard to meet these demands. So the students do their working drawing, but in a very academic environment, with no parallels with real practice.

Researcher: *I want to ask you about the various subject groupings within the curriculum. Firstly the cultural context, such as the History and Theory of Architecture.*

Hariri: The preparation of the students is very weak on this subject, and sometimes the teachers and the students are not convinced of the importance of the subject. Sometimes the teacher is a non-Saudi and has a limited perspective of the cultural context within which Saudi architects have to operate, so that he cannot transmit it properly to the students. In the Saudi Omran Society we held a lecture about the future of Islamic architecture. It was supposed to be well attended by teachers and students, but very few people showed up. This will show you how unimportant in people's minds this topic is.

I forgot also to tell you that there was supposed to be within the School of Architecture a research centre the function of which was to develop the curriculum for and knowledge of architecture, so that the curriculum would have been devised in an informed and constructive manner, and would have driven towards its educational goal.

Now the curriculum and the subjects seem to follow arbitrary paths, according almost to the whim of the individual teachers.

Researcher: *How about the building technology courses in your School?*

Hariri: This is taught theoretically, without an immediate application of the knowledge transmitted, so that eventually it has no real impact.

But I would like to mention one more thing. The physical environment is very important in the training of architects. The building where architecture used to be taught in our school was old and in a bad state of repair. It was in any case poorly designed. This meant that the students had no examples or archetypes to observe to see what a well designed and constructed building looked like, how the various systems it incorporated integrated with one another. Now the School has moved to a new multi-million dollar complex, where the students can see from their surroundings live examples of good design and construction, and how the various disciplines in architectural training contribute to an integrated and efficient structure.

Researcher: *How about the professional practice courses?*

Hariri: Unfortunately professional matters such as office administration, finance, and economics are not taught in the School. Also site supervision, although an integral part of an architect's work, is not covered. Moreover, construction details and specification are taught too hastily.

Researcher: *What do you think are the causes of the gap between training and practice? The teacher for example?*

Hariri: Some of the teachers lecture in a very primitive manner, just reading out their text, without using any other teaching aids. I'll give you one example. We held a conference in the Saudi Omran Society. The speakers were teachers in schools of architecture, and the audience were also teachers in schools of architecture. I observed on more than one case that the lecturer was not utilising a teaching aid correctly. One speaker placed his text in the projector so that it was projected to the audience, and then proceeded to read from the transparency! On the final day I made the point to the audience that if we are lecturers and do not even know how to use audio-visual teaching aids properly, then how can we teach? Perhaps we should have a course for university teachers, training them in teaching methods and techniques. Teachers have the knowledge, but some don't know how to convey it.

Another problems with the teachers is that teachers don't practise. The only professionals who teach at the university who are allowed to practise are medical doctors. Even officials are not convinced of the importance of teachers actually being involved in architectural practice. We were at one time in a meeting with the Minister of Higher Education, and we demanded that teachers be allowed to practise while teaching, and the Minister argued that 'you are practising through teaching'.

One effect of the gap on the student is that, when he goes to an office after graduation, it takes a long time for him to acclimatise himself to the practice.

Interview 9

Saleh, Hussain

Umm Al-Qura University

Researcher: *Can you give me some information about your educational background?*

Saleh: I got my B.Arch. in Egypt and then I completed by higher education in England and in the USA. I had overall executive and administrative responsibility for the construction of the new campus at Umm Al-Qura University. Currently I am Professor of Architecture at Umm Al-Qura.

Researcher: *Do you think that there is a gap between architectural education and practice?*

Saleh: Yes, there is a gap, and this gap could be attributed to many causes, basically that the schools do not reflect the nature of architectural practice. In the past the architect was the leader of the building team, but now he is just a member of the team. Architectural education in Saudi Arabia trains the student for the former. The emphasis is always on the work of the individual and the education is not organised to allow the student to work in a team. Architectural practice is in reality a collaboration of many different specialists. In practice the architects work with urban planners, with landscape architects, and with other professional specialists like mechanical engineers, structural engineers, etc. The schools of architecture do not allow the students to work together in projects.

Researcher: *I understand that you are the instructor of the Professional Practice Unit in this school. Could you tell me more of what the Professional Practice Unit is all about?*

Saleh: The Professional Practice Unit is one year (two semesters) long and makes up the fourth year before the graduation project section. In the Professional Practice Unit the students are confronted with problems from the real world. The students meet with a client and there is always open dialogue between students and the client. The students then try to understand the requirements of the client, and then the students start to design the project. After the design work the students meet again with the client, who selects one of the designs offered. This is the first stage of the process. After the project is selected then all the students go to produce the working drawings for it. In the Professional Practice Unit we emphasise the learning process more than the teaching process. By that I mean there is no syllabus that we have to work through with the students. Rather problems come up as the students work on the project, and we try to deal with them as they arise.

Researcher: *When the students do the working drawing, which text book do they refer to in doing the details?*

Saleh: We use the working drawing, which was done by the American firm which did the actual campus design. Since the students are studying in the new campus, then they can immediately relate the working drawing with the details required for their design, as they are all around them to be observed.

Researcher: *How is the Professional Practice Unit different from any other design studio?*

Saleh: The difference is that in the Professional Practice Unit the student can identify the problems and the various elements of the project. Also in the Unit, as I mentioned, the students are required to do working drawings such as electrical, plumbing, air-conditioning, and structural drawings, so that the student can see how the different systems are incorporated in the design. Moreover, we select some part of the building and a student is required to produce all the architectural details relating to it.

Researcher: ***Do you have any comment about the Professional Practice Unit that you would like to add?***

Saleh: The Professional Practice Unit as a concept is successful, but it lacks the plug-ins. Unfortunately there is no support from other departments, such as Civil Engineering, to help in solving structural problems, or Mechanical Engineering, to help us with air-conditioning. In the Professional Practice Unit only the architecture staff help the students from our own experience which we gained in practice. Also only architecture students work in the Unit; there are no students from other departments.

Researcher: ***What is the effect of the gap on the students?***

Saleh: As I told you, the gap is between the teaching and the learning. When the students come to the Professional Practice Unit I can see that there is a clear weakness in the students, and that is their understanding of the different systems that are operating in the building, and these are the electrical system, the mechanical system, and the structural system. And there is also a great weakness in the students, in that none of them knows anything about detailing. I have been teaching architecture for many years now, and none of the students I have taught knew anything about detailing. And this is what I mean by the gap between teaching and learning. The information, obviously, we are giving to them, and the students sit in the lecture and read the handout notes, and sit the examination. Some of them gain an 'A'. But as soon as the exam is over it is all gone. Learning, on the other hand, is when a student is faced with a practical problem and has to take steps to solve it, such as going to his teacher or consulting works in the library, and he will never forget it.

For example this year we are designing a multi-storey government building, and one of the tasks of the students is to design the vertical circulation system. They have to consider how many elevators are needed, the size of the elevators, and their speed. They were taught the relevant information in the third year, and were given handouts. However, when they come to the Professional Practice Unit in the fifth year, all the information is gone and we have to re-educate them about it. Before the students come to the Professional Practice Unit they don't understand the importance of the design supporting subjects of the curriculum, such as building science, structure, economics, etc., and the reason for that is that the students are taught these subjects theoretically only. They are not required to apply them in the design studio. In the design studio there is an emphasis on the formal aspects of design at the expense of the supporting subjects, so that the students gradually become more convinced that these subjects are inferior to the design studio and of no importance whatever. Because of the time that the students spend on design, they have no time to study these supporting subjects. One sign that they are not convinced that these subjects are important is that they study them only in the final week before the examination, after they finish their design project, and they do so only to pass the exam. Furthermore the students discard all the handouts on the subjects after the examinations; they don't even keep them.

Researcher: ***Why do you think there is this gap between training and practice?***

Saleh: One problem is that teachers in schools of architecture in Saudi Arabia do not practise architecture, so that the student cannot learn from the teacher's behaviour. Also we need to filter the students at the admission stage, because not all of the students we have here are cut out for architectural studies. To avoid this problem in the future, the admission procedure should include interviews and an aptitude test. The environment also plays an important role in the education of the architect. The Aziziah campus was not a healthy environment. However, now in the Abidiah campus students can learn from the buildings.

Interview 10

Mohammed-Ali, Zaini

King Abdul-Aziz University

Researcher: *Can you give me some information about your educational background?*

Mohammed-Ali: I gained my B.Arch. from the School of Environmental Design in King Abdul-Aziz University. I then went to England to gain my Ph.D., which I was awarded in 1993. Currently I am Assistant Professor of Architecture and the Vice-Dean of the College of Engineering and Environmental Design.

Researcher: *Is there a gulf between architectural education and practice in Saudi Arabia?*

Mohammed-Ali: Yes, there is a gap. It is the gap between what we are educating our students for and what they work as after they graduate. We educate our students to be designers, mainly. However, though in practice some of our graduates do work in design, some of them also work as, for example, building contractors. Most of them work in the governmental sector, where their jobs are mostly architecture-related administrative work.

Researcher: *How do you think this affects the students?*

Mohammed-Ali: Our students find that, when they enter practice, they do not know how to work with Autocad.

Researcher: *What are the causes of the gap in your opinion? The curriculum for example?*

Mohammed-Ali: The curriculum is written in an excellent fashion; everything is there. And this is not an indication of whether the school is good or bad. However you need a good teacher, a good syllabus, references and text books, a healthy environment, and good lab facilities to make a good school. I admit that our curriculum has some repetition in the subjects, but this problem could be solved by co-ordination between teachers. I, for example, teach Building Construction. I make a great effort to train the students how to be construction supervisors from the start, when the contractor takes the working drawings, to the end, when he hands in the project. I take them through the different phases of a project. I compare the construction phases with the phases of the traditional methods of construction. I also take my students regularly to construction sites to relate what I teach them in class to what is going on in actual projects. And, believe it or not, the teacher who teaches working drawing comments that they are better off than students who have taken the Building Construction course with other instructors.

Researcher: *How about the students?*

Mohammed-Ali: We have a problem in our admission policy. We do not have an aptitude test or interview with students before they are admitted. We admit them based only on their high school diploma grades, and this is not really a good criterion. Sometimes you can find a student with a 70 percent average whose architecture school performance is better than that of a student with a 90 percent average, because of his superior interest and motivation.

Researcher: *How about the physical academic environment?*

Mohammed-Ali: As I told you, our students, after they graduate, have a problem working with Autocad. And this may really be attributed to the fact that we have no computer lab or technicians, because of the routine and the limited financial resources. If the School wants to keep up with the market, we should have a full computer lab with full technical support. The availability of labs in the School is one thing, however; utilising them is another. We have had an excellent materials lab ever since the School was founded, but is has never been used in the teaching process because there is no technician to operate it. No teacher is willing to take the responsibility because if the possibility of accidents.

Researcher: *How about the library?*

Mohammed-Ali: The library is terrible. There are no books, and no money to get books. Without text books we cannot teach.

Researcher: *How about the summer training?*

Mohammed-Ali: It is very short, and it is not organised or supervised by the School. I don't think there is any input beneficial to the student.

Researcher: *How about the duration of the course of study?*

Mohammed-Ali: This was six years in the past, but now it has been reduced to five years because of the market - demand and supply. Ten or fifteen years ago there was plenty of work for architects, but now the competition is much greater and jobs are fewer. Medical students study for six years, and then in the seventh year they become residents for hospital training, for which they receive a salary. When they graduate they are employed for SR 13,000. Architects, when employed, get SR 6,000. When the medical graduate is employed he is employed at the eighth grade; the architect is employed at the seventh. The reward is different, my friend. If an architectural graduate is employed in any government agency he cannot augment his salary by working part-time in another practice because the government does not want a conflict of interest. However, a medical graduate can be employed in a government hospital, and yet also work as a part-time consultant in a private hospital. That is why we are getting fewer an fewer students every year.

Interview 11

Mufti, Farooq Abbas

King Abdul-Aziz University

Researcher: *Can you give me some information about your educational background?*

Mufti: I got my B.Arch. from King Saud University in 1974. I then completed my Masters in 1978 and my Ph.D. in 1981 in the USA. Currently I am Associate Professor of Architecture in the School of Environmental Design.

Researcher: *Do you think that there is a gap between architectural education and practice?*

Mufti: I don't think the problem is with the education; it is with the student. The quality of the students we are getting is getting poorer and poorer. We are getting students without ambitions, who just want to get good grades, pass their exams, and get their degrees.

Researcher: *What is the effect of this gap on the students?*

Mufti: The students finish the course still needing to know more about technical aspects and project management. About design they cannot be taught any more. Nevertheless, in every ten students there is only one good designer, and this is the one who goes on to work in design in practice. The others work in different aspects of the building industry such as construction management, as building contractors, working drawing consultants, etc. The School should prepare the students for these jobs too

Researcher: *What do you think is the cause of this gap? The curriculum for example?*

Mufti: The curriculum needs to be reviewed on a regular basis. However, our curriculum has not been reviewed or assessed in twenty-six years. The reason for this is bureaucratic procedure and red tape. To change or develop the curriculum is a lengthy procedure. Our School is not a separate entity but is affiliated to the College of Engineering, and the Committee of the College has to approve the new curriculum, and then it has to go to the Curriculum Development Committee, then to the University Committee, then to the Ministry of Higher Education. By the time all this is done, the proposed new curriculum is already out of date.

Researcher: *How about the physical academic environment?*

Mufti: The problem with this is the budget to support it is always getting smaller and smaller. We get only SR 35,000 a year to maintain it, which is a very small amount. Also we do not have the technicians to operate the labs. For example we have a workshop that cost the University SR 1 million, but we cannot operate it because there is no technician. The photography lab also has never been used because there is no technician, and the materials have all passed their expiry date. The library has not received even one new book or periodical in the last ten years. It is difficult to teach without texts, and the students are not kept up-to-date.

Researcher: *How do you evaluate the students' work in the design studio in your school?*

Mufti: At the conceptual level it is good, but in the architectural details and technicalities it is not. The School is convinced that it should be left to the summer training to cover these aspects. But unfortunately we have no control over the summer training; we only get the office's report on the student. Some of the offices used in training take it seriously, and others do not. But the School needs to go there and supervise the student.

Researcher: ***Do you have further comments you would like to make?***

Mufti: Elsewhere, where architectural education is taken seriously, co-operation and support from architectural offices and practitioners play a paramount role in the training of architects, but in Saudi Arabia this is not the case. Sometimes, for instance, we ask private practitioners to bring their work to the School for the students to see and to learn from, and sometimes we ask them to come and lecture about their practices, but they are unwilling to help. Furthermore, the School offers its expertise to private practitioners to assist them with some of their work, but they again are generally unwilling to accept this assistance.

Although this is the case with the private sector, with the government sector we sometimes find willingness to co-operate. One example of this, which was particularly beneficial, was that the School was asked to design a sculpture for the approach avenue to King Fahad Airport in Dahran. The students worked on this project from the design stage onwards, taking it through it various other stages including contract negotiation. In this project we also had to hire the services of another firm for some of the technical work, so that the students saw how co-operation between various specialists works in practice. The students who worked with me on this project commented that it was the most beneficial experience in their training.

Interview 12

Tarim, Jahed

King Abdul-Aziz University

Researcher: *Can you give me some information about your educational background?*

Tarim: I graduated B.Arch. from the School of Environmental Design in Jeddah, and then I gained my Ph.D. from the University of Strathclyde in Glasgow in 1992. I am currently Chairman of the Department of Architecture in King Abdul-Aziz University.

Researcher: *Do you think that there is a gap between architectural education and practice in Saudi Arabia?*

Tarim: Yes, I think there is a gap between architectural education and practice. But I think it is a natural gap, a gap you can find in any system of professional education. The theoretical side should be covered in the school, while the practical side should be covered in practice. So our graduates are like any other graduates in the world, prepared with all the knowledge they need, but requiring further experience in practice that they cannot get in the school.

Researcher: *Could you give me some examples of things that are not covered by the School and are covered in practice?*

Tarim: There are some aspects that are not fully covered in the School, such as working drawing, architectural detailing, and specification. We have a course on working drawing, for example, but naturally we cannot put too much emphasis on this at the expense of other subjects. I think the role of a university is to give you a synopsis of each subject, and then the student after he graduates should build on this basis.

Researcher: *From your experience how do you see the effect of the design support courses manifesting itself on the work of students in your school?*

Tarim: It does not really manifest itself in their design work. This is a serious problem. There should be an integration between the various subjects of the semester, between all these subjects and the design studio. For example when a student is taught Structural Analysis in one semester it should be stipulated that the application of it is in the design studio with relevance to the design project. Also in the case of mechanical systems the teacher should come to the design studio and see to it that the students are applying the knowledge he has transmitted to them, and that it <u>does</u> manifest itself in the design studio. The programme in the School of Architecture was designed by Morris Cambridge of Harvard University, and he said that there should be co-ordination between the different subjects of the curriculum and that the design studio is the practical location where all these subjects should be put into application. The teaching of the subjects should be in the form of problem-solving. For example if there has been some teaching input on wide span structures in a certain semester, then the design project in that semester should relate to a structure where this element is found, such as a gymnasium or concert hall.

Researcher: *Why do you think the other subjects do not manifest themselves in the students' design studio work?*

Tarim: Because there is an emphasis on the conceptual aspects of design.

Researcher: ***How is that?***

Tarim: The design school instructor places a great emphasis on the conceptual side of things. The students, under the influence of the instructor, spend a great deal of time in designing the floor plans. The instructor may give a student a design project, and then ask him to make an alteration here and an alteration there, and so on, which is something that could go on indefinitely. After the student eventually comes up with what the instructor considers satisfactory floor plans, the instructor holds a preliminary jury which looks at students' designs, and this also concentrates on conceptual design aspects, making further suggestions for changes, so that the student has to go back and do further floor plan work. This goes on until the last week, when the students are left to prepare their final presentations. I think that working on the conceptual side of things should stop at some stage. For example if the semester is about ten weeks long, then after four to five weeks the students should begin working on the details.

Researcher: ***In your opinion, what are the causes of the gap? The curriculum for example?***

Tarim: The curriculum here is about one hundred an eighty credit hours and it covers everything. The students study structure, environmental control systems, etc. The problem is not with the curriculum, but with how the curriculum is delivered.

Researcher: ***How about the physical academic environment?***

Tarim: In our School we have a financial problem in the first place. Labs, workshops, and libraries need equipment, they need books, and they need technicians. We simply don't have the financial means to run them. We have a library that we cannot add one book to. We have one model workshop, and if any item of equipment went faulty we could not repair it. We have a computer lab of ten computers, which, as you know, is not enough for all the students. If any computer were to go down we would not have the means and the money to repair it. This lab, by the way, was donated to the School by a wealthy merchant.

Researcher: ***Do you have any comments that you would like to add?***

Tarim: First of all the School, in preparing its students, emphasises the role of the architect as a designer. In practice professionals who work as designers are few; the majority work in different domains, such as government agencies or in building maintenance. Another comment I would like to add is that Saudi Arabia ought to have a professional body that would organise the profession, and control practice and education.

Interview 13

Akbar, Jameel

King Faisal University

Researcher: *Can you give me some information about your educational background?*

Akbar: I gained my B.Arch. from King Saud University, and then my Master's and Ph.D. from M.I.T. Currently I am Associate Professor and Chairman of the Department of Architecture at King Faisal University.

Researcher: ***Do you think there is a gap between architectural training and practice?***

Akbar: Before I answer this question, I would like to ask you a question. If you have a tropical plant, can you grow it at the North Pole? The logical answer would be no, unless you create the conditions for it. Architectural practice is an amalgam of contributions from various parts of the world, and architectural training is likewise an amalgam of contributions from various countries, so that the two are not dovetailed with each other to start with. Furthermore we then try to transplant them to Saudi soil, and they do not take to the local environment. So as an answer to your question, yes, there is a gap.

Researcher: ***What is the effect of the gap on the students?***

Akbar: The medical student is not given his degree unless he practises medicine in a hospital under the supervision of qualified doctors. In architecture we don't have this. Our student while studying does not practise architecture; he studies construction from Mitchell and McKay.

Furthermore, as far details and specifications are concerned, what the student studies is not what is available and used in the market. Another thing, regarding building laws. After the student graduates he has to deal with building laws and regulations of the municipality. He has to deal with laws concerning electricity, water, and sewage. He has to deal with fire and safety regulations, etc. In the school the student is not exposed to these matters, merely because the teacher himself is not a practitioner. Most of the teachers are very good at the level of architectural theories and design principles. However, because they lack practical experience, they are deficient in the practice side of architecture.

Another example is the cost of the building. The student does not take into consideration how much the design will cost, or how to design to a limited budget.

Even the selection of the materials needs to be carefully addressed in the school. In Dammam, for example, the water is salty. In the Saudi market there are water taps which are salt-resistant; others are not. The consultant ought to know which to advise, otherwise the client may find that the wrong type of tap is fitted and it begins to corrode after some months. Likewise there are tens of types of heat and water insulation. Some of these are good; some of these are bad. The student must know about the right type of insulation to use in order to be able to give the client the correct advice. But in fact the teachers who teach heat and water insulation do not even know what types are available in the market. Not only should the student know about these things, but they should also know about the effect of all these things on their designs.

The thing is that there is no link between the different subjects of the curriculum and the design studio. The students, for example, study structural analysis. Some of them pass their exam with an 'A+' grade. However their work in the design project does not reflect the 'A' they got in Structure. For instance a student will learn in Structural Analysis about various types of structures, but when it comes to his design project he will always chose a reinforced concrete option with columns and beams, whereas for his project a load-bearing wall design might have been more appropriate. Moreover the student does not even know how to do mechanical calculations, such as how many tons of air-conditioning are required to cool a room, and the depth and length of the air-conditioning ducts. The student does not know how to design economically. For example when designing a room a student will put a column at each corner, with connecting beams. But in the case of a room with a five metre span, for example, an additional supporting column in the middle will in fact reduce construction costs. Likewise the student does not take into consideration the re-use and adaptability of his design. Buildings usually adapt to different uses. For example, in the traditional Islamic city almost all the buildings bear this economic concept of re-use and adaptability, so the traditional architect would always think ahead to the possible use of rooms and spaces for purposes other than that for which they were originally planned, and take into consideration such factors as the potential for converting two rooms to one large one, and so on.

Also there are things relating to the client that need to be understood for a design to be successful. In the schools they teach the student only about privacy as the main social concern of the design, but there are other things to take account of and they can only really be grasped once a student starts to practise architecture. For example, the arrangement of the spaces in the home and the relationship of each space to other spaces, like the relationship between the entrance to the home and the location of the study. The relationship of the dining room to the kitchen, etc.

Researcher: *At the end of this interview do you have further comments you would like to add?*

Akbar: Yes. I think that students have no interest nowadays in the study of architecture, though I don't quite know why. They seem to have no interest in doing their own study or finding out what to read. Nowadays they only want to get a degree, so that they can go and get a job with it. If you give a student a section to draw he doesn't know how to do it. Architectural education and practice in this country are like two separate planets, with space between them.

Interview 14

Hilton, Keith

King Faisal University

Researcher: ***You have been teaching architecture for ten years here in Saudi Arabia, and before that ten years at the University of Newcastle and three years at the University of Kent. From your extensive experience, how would you say the practice of architecture in Saudi Arabia compares with the UK?***

Hilton: Practice in Saudi Arabia is different from in the UK. A lot of the detailing of buildings is left to the contractor. A lot of the architects do very minimal drawings. In the contractor bids the architect does 'shop drawings' to use the American term. In the UK the architects do all the drawings and most of the drawings of details and technology. Graduates in the UK are expected to have much more technical knowledge as well as design skills than students need here to survive. There is very little interest amongst the students in technical solutions to problems. They approach design more like designing a shape and then you go to an engineer and he can do the structure and the services.

Researcher: ***Where is the problem coming from?***

Hilton: It is the expectation of the practice and how practice is carried out. It comes from the students too. They are not interested in putting buildings together very seriously.

Researcher: ***Why is that and how is that?***

Hilton: Because of the practice influence. If you go to an office in Saudi Arabia the technicians do the shop drawings and the Saudi students rarely interest themselves in that kind of detail. You find reluctance to get involved in technology. A lot of buildings are drawn in a very simple way, i.e. plans, elevation, and site plans. We talk in classes all the time about the service technology and how it affects design decisions at the different stages of the design process. However, when it comes to designing the buildings it is forgotten and you get the same cardboard cut-out sort of elevation.

Researcher: ***Was that the same in England?***

Hilton: No. There was more interest in materials and surfaces, and also the influence of the year out, which brings the students face to face with the reality of practice.

Researcher: ***Why is it like that?***

Hilton: The compartmentalised way of thinking. You do this thing and you pass it and you completely ignore it after that. They don't realise the value of it. This is how secondary education in this country is organised. It encourages the student to memorise. It does not foster analytical thinking. We have some students who are very good at memorising but not applying. I the Housing Theory course I use a lot of sketches and drawings. Some of the students get an 'A', but when they sit down to do the housing programme they are as though they have not learned anything about it. The problem is getting worse as time progresses.

Researcher: ***Why?***

Hilton: I don't know. Some say the secondary schools admission standard is lower, but I know there is a great difference between students graduating seven years ago and students graduating now.

Researcher: ***What about taking climatic considerations into account?***

Hilton: We teach the students all the time about passive solar energy and sun devices, but when it comes to the design you see these things missing from their drawings.

Researcher: ***What can you say about the students' working drawings?***

Hilton: They can reach a high standard during studio work, but again it is compartmentalised. You don't see the influence of this course in the design studio next stage.

Researcher: ***How about the summer training?***

Hilton: The summer training here in Saudi Arabia does not seem to do what the year out does for UK students. In the UK there is a logbook and the students must fill all the boxes, including construction site supervision.

Researcher: ***Do you think there is a gap between architectural education and practice?***

Hilton: Yes, in most places. But it is bigger here.

Researcher: ***Why?***

Hilton: First, job prospects in the market are not very good. Most of the students do not work in their primary role as design architects, but in architecture related jobs. Second, Saudi students get bored very quickly and don't work long hours. The gap would be reduced if you had a period of professional practice longer than the summer training, if you employed practising architects as studio tutors, and if the curriculum allowed the students to do different projects, not have everybody doing the same thing, so as to develop more independence.

Researcher: ***What about the teachers of architecture?***

Hilton: When I was working in Kent five years ago I was a course director. There were very few full-time staff. The main studio staff were young practitioners who worked in pairs and these were bringing knowledge from the cutting edge of design and technology to the studio, and that does make a terrific difference. I understand that in many systems in any part of the world the best academic qualification is considered to be a Ph.D. What you find in American and British universities is that people of doctoral level tend to be doing research within the universities or they teach specialised subjects such as history of architecture.

Researcher: ***How often does the school take students to construction sites?***

Hilton: Not often enough. There are not too many sites to go to in this region of the country. You want to show the students good buildings.

Researcher: Do you have any thing you want to say about the students?

Hilton: What we are missing now is competition between students. At one time Saudi Arabia had a lot of scholarship students from other Arab countries, who were ninety percent pass students in their own countries. They were very competitive. The Saudi students competed against them. The dynamic of that situation was good. I remember when we had classes who were genuinely learning. Sixty or seventy percent of the class were in the 'A' and 'B' category, and they were earning that. I can look at the work now and see the difference. If you keep educating architects you will flood the market. Because it is a young society the job opportunities are not going to be there for a long time.

Researcher: How about the physical academic environment? The students say there are no services, no books, and no lab.

Hilton: It isn't true. The students don't use the facilities very well. Some of the books are very old. But there are some up-to-date journals in the library but the students are reluctant to use them.

Researcher: Why?

Hilton: Maybe because of the language barrier and because the students don't make the effort.

Researcher: What can you say about the curriculum?

Hilton: The subjects in the curriculum are like the subjects you find anywhere; it is how to deliver the curriculum and by whom it should be delivered that are the questions. A further point is that the curriculum has a sausage machine effect because all the students do the same thing at the same time, and that does not encourage individual development.

Interview 15

Lyali, Sameer

King Faisal University

Researcher: *Can you give me some information about your educational background?*

Lyali: I graduated B.Arch. from King Faisal University. Then I went to Edinburgh, where I gained my Master's and, in 1990, my Ph.D. degrees. I am currently Vice-Dean of the School of Architecture at King Faisal University.

Researcher: *Do you think there is a gulf between architectural education and practice?*

Lyali: Before I answer this question, I would like to give you a brief history of our School here. In the past, when the School was founded, the five-year programme was called 'Architectural Education and Planning'. All the students used to study together for four years, and then in the fifth year, the student chose a graduation project with a speciality in either landscape, planning, or architecture. Each student did their design project around their speciality and took classes in it. So the student used to graduate with a degree in Architecture and Planning.

After that, in 1984, the University of Rice in Texas, USA, was consulted to design a new architecture programme. This programme was five years and a half long, and it was similar to the previous one largely; the students graduated in Architecture and Planning. They added some subjects, and removed some, and extended the programme by half a year. This programme lasted until 1989, when each speciality established its own department, with a programme for each one. What happened was that there was a divorce between the departments. Instead of having one good comprehensive department, we now have three below-average departments. The reason for this divorce was that, when students who had gone abroad to do postgraduate work returned, they wanted to establish a department with their own speciality. So now the students initially study a one-year orientation programme, and after that they specialise, in architecture, landscape, or planning. So our graduates now are narrow minded. A graduate of architecture does not know much about landscape or planning, and a graduate of landscape does not know about architecture, and so on. Our graduates do not know how to deal with other disciplines. Because there is no co-operation between the three departments we lost the interdisciplinary nature that our programme used to have. Furthermore, because of the shortage in teaching staff, each department now cannot support its programme.

Now I have designed myself a new programme, a five-year course. For three of those years the students of architecture, landscape, and planning study all together, and then they specialise for two years.

Researcher: *Have you thought of increasing the length of the course from five years to six years?*

Lyali: No, because the programme failed to get enough students when it was five and a half years long, due to the market situation. The length of the programme would scare students away. The reason I designed a new programme was that, under the old system whereby students had one year of orientation and four and a half years of specialisation, they used to sign of for their specialisation even at the beginning of their orientation year. Such a decision can hardly have been well-informed. Indeed, students used to avoid or choose their specialisation for quite the wrong reason, because there was family pressure to do planning, or because they felt that a course in Landscape simply meant they would be a gardener with a certificate, and so on. With the new programme, the choice of specialisation is made after three years, when the students will have learnt something about all three specialist subjects, and will thus be able to make a more informed choice.

This new programme, which took a year and a half to design, has been opposed by the teaching staff of the Departments, who claim that it is a backward step and that it is an attempt to bring together again subjects which had achieved department status. Each Department wishes, it seems, to protect its own interests. But I attended a conference last month in Riyadh on the future of higher education in Saudi Arabia, where one speaker from Singapore University said that, to approach the twenty-first century confidently, we have to do away with the multiplicity of programmes, with its repetition and division of subjects, and we should devise one core programme for all environmental design students, with specialisation only in the last year. The speaker said that environmental design by nature is a multi-disciplinary practice, and education should reflect this.

Researcher: *What is the effect of the gap on the student?*

Lyali: The effect of this gap is that the student lacks architectural technology and architectural practice in his work. The reason for this is the lack of support from other departments in the College. The subjects are disassociated from the design studio. The students are taught Building Technology, for example, in the Building Technology department, but design is taught in the Architecture department, so that what they learn is not related in any way to the work in the design studio and is not supportive of it. There is no backup from Building Technology teachers for architecture students, and no co-operation between the teachers of the one department and the other. The problem started after the divorce between the departments. The students in the past, before the divorce, produced a higher quality of project, because the different curriculum subjects were well linked with the design studio. In the studio there were teachers of structure, building science, construction, and architecture. So the decisions that the students made in the design studio were made in consultation with the teachers. So they were like a committee or a team. Now the students take arbitrary and uninformed decisions.

I will give you two examples, one structural and one mechanical. The structural one is that when members of the jury come to the School from outside they find that the structural problems are not solved, from the point of view of selecting the suitable structural system and the approximate sizing of structural elements. In some cases the student uses reinforced concrete where the most suitable material for his project is steel. Sometimes the student uses a shell structure when the area covered is too small for such a structure. On occasions the students in large spans still use beams when they could have used a waffle structure. When the jury asks a student why he did this when he could have used a system more economical than the one used, he cannot give an answer.

The mechanical example is that the student fails to choose the right air-conditioning system for his design; also he fails to do the approximate calculation of the sizes of air-conditioning units he needs and the sizes of the ducts. So we find the projects of the students are good from the point of view the floor plan, but on the other hand the are not good from the practical point of view; the problems are not solved.

Architectural technology is very important for the design to be successful, and it starts with the structure, with the mechanical services, etc. Although the students have studied all of these subjects, they don't apply them in their projects. And the students

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Researcher: *How about working drawing?*

Sa'ati: Unfortunately it is not covered well enough. The student during his course of study at our School does only one or two sheets at the most of working drawing.

Researcher: *How about building technology courses?*

Sa'ati: These are in the curriculum, and we do teach the student these subjects. We should follow up on the practical application of these theoretical subjects. Our problem is that the ratio of students to teachers is very high.

Researcher: *What are the causes of this problem? The teachers for example?*

Sa'ati: The Saudi teacher unfortunately does not practise architecture. Without this he will not understand the complexity of architectural practice, such as the relationship of the architect to the client, to the contractor, and so on.

Researcher: *Can I ask you about the physical academic environment of your school, such as the library or the labs in the School?*

Sa'ati: The problem with the library is the resources. The new arrivals in terms of textbooks and journals are very weak. It is also inadequate in terms of electronic information systems. Our labs too need serious updating.

Researcher: *Could you tell me about the summer training?*

Sa'ati: It is too short in duration, merely eight weeks.

Researcher: *Could you tell me about the co-operation between architectural practices and the School?*

Sa'ati: There is not much co-operation at the moment, but I think there should be some seminars given by practitioners here in the School, and that they should also be members of the assessing juries. Our problem here in the Eastern Region is that architectural firms are few. There are not as many as in Riyadh and Jeddah.

Interview 17

Ustankok, Okan

King Faisal University

Researcher: *Could you give me some information about your educational background?*

Ustankok: I completed my B.Arch., Masters, and Ph.D. degrees in the Middle East Technical University in Ankara, Turkey. I have been teaching in Saudi Arabia since 1988. Before that I spent the years 1983-1988 teaching in Jordan. I started teaching in the Technical University of Ankara in 1971, which is the university where I received my education.

Researcher: *Do you think there is a gap between architectural education and practice in Saudi Arabia?*

Ustankok: That is a difficult question because I am not exposed fully to architectural practice. However, the answer I am prepared to give goes deeper than that. I don't subscribe to the idea that practice should be the dictator of what is taught in the schools. Or if you look at it from the outside, the schools should not be only preparing students for practice, because this will place the schools on a level where they only follow in the footsteps of practice. I think universities have other roles in society. They have to keep ahead of practice. There are schools which provide an intermediate level of education that makes people ready for the practical world, teaching them either about how the office works, or how construction is managed, or how blueprints are read, but I think that the social responsibility of the architect, the way the architect looks at his job, the way he places himself in society requires something other than only preparing him for practice. This, simply, is why there is a gap, because the schools must keep ahead of practice or operate outside practice. We are not only preparing people for the use of offices; this would be cheap labour for the existing offices. If the function of the schools is only to prepare students for practice, then who will ask the questions about the nature of the practice? When I look at the result of practice in Saudi Arabia, the built environment, I find hundreds of buildings that I don't want my students to regard as models to learn from.

Researcher: *When I meet with employers they complain about the fitness of graduate students for practice. In your opinion, do you think that there is something wrong about the curriculum?*

Ustankok: On paper there is nothing wrong with the curriculum. When you look at the curriculum you would say, 'What else is there to teach?' We don't expect all our graduates to work in architecture. In fact those working in architecture are a smaller percentage than those who do other jobs. More often than not a larger number of our students come to school because it is expected of them to go to schools of architecture. They don't really have a genuine interest in architecture or in becoming an architect. This really hampers the way they assimilate information from the curriculum. They fail to put together all the different systems and information that have to contribute to the synthesis of design. All the ingredients of architecture are in the curriculum, the entire social and history courses, all the environmental control courses, all the structural courses, all the construction courses. All the ingredients of the soup are there, but the soup is not made.

At the end of the design studio work we have a jury to evaluate the success of the student. We find that it is a rather small percentage of the students who are responsive to all the requirements of the curriculum. You find nevertheless that students who are falling short in this still get to graduate one way or another, and bad buildings get built.

What makes a good architect is not only the school. The school paves the way. There is more to learn in architecture than there is to teach. You can only teach a certain number of technical or non-technical courses, and you practise in the design studio. But what makes an architect is what he learns from everything that he looks at, from the schools themselves and the environment. I think the gap is not between practice and the schools but between what is expected from the curriculum and how it is received by the students.

Researcher: *In order to bridge the teaching/practice gap, do you think that teachers of architecture need to be practitioners themselves?*

Ustankok: It is not an overall general assumption that in order to become a good teacher you have to be a practitioner. I don't think there is a direct correlation.

Researcher: *What about the School facilities in your school?*

Ustankok: It is true that some of our facilities are not as richly endowed as some of the other schools in the country. It is of course a hindrance.

Researcher: *What about the summer training?*

Ustankok: There has to be a stricter follow-up on that, because as long as it is a certificate from anywhere, then it does not serve the purpose.

Researcher: *Practitioners complain that the students lack the practical background to architecture, i.e. working drawing, specification, construction supervision, etc.*

Ustankok: I take this comment more seriously, because that means that after three semesters of construction, environmental control, design studio, special courses in contract documentation, special courses in cost estimates, special courses in professional practice, etc., our students need to be re-educated by the people who employ them.

Researcher: *What about structure?*

Ustankok: Students do not have a grasp of the notion of structure.

Researcher: *Why?*

Ustankok: Because Structure is taught to architectural students in terms of civil engineering calculations of the critical sections of columns and beams, instead of as the conceptual understanding of structure, such as what sort of structure is appropriate for what sort of building design without necessarily going into the calculations involved. An architecture student is not going to function as a civil engineer. There will always be a civil engineer to help the architect in the calculations, but the civil engineer will not help the architect with the notion of what structure is appropriate for the space he is designing for a particular project. This is where we lack the full understanding of structure in our students.

That is why in the design studio one can see that our students are not enriched in their thinking with the correct structural concepts. However, in their courses they are getting good grades because they know how to calculate. But that is not what we expect from them and neither is it the thing that is expected of them in practice. No one asks the architect to calculate the cross section of the column when they start working in an architectural office. But they do expect you to choose the right sort of structure for the right sort of space for the right sort of money.

Researcher: *How are the students prepared as far as construction management and site supervision are concerned?*

Ustankok: The students lack these. The curriculum does not prepare the student in that direction.

Researcher: *How about the admission policies of students to your School?*

Ustankok: I think that the shortcomings that the students carry with them as they graduate come from the selection criteria at the entrance level. If we are admitting students who are not talented enough or inclined enough, scholastically apt enough, for the study of architecture, then at the end you will have someone who is not really trained as an architect. So the end result starts with the entrance level. We have observed that, when we lower the entrance requirement compared to the years before, we always have worse result, so I think there is a correlation although it is not scientifically proven. What is necessary is for more selective criteria to be applied. We do have a certain GPA average after the high school, and that forms the basis of our admission. We have an architectural aptitude test given to students, but it is not really effective for a number of reasons. One of the reasons is that the grading system in the high school has been decentralised in Saudi Arabia. That means that seventy out of a hundred in one school is not necessarily the same as seventy out of a hundred in another. That has been a negative influence in assessing the quality of the student coming out of the high school. So we have lost the yardstick to measure student quality.

On top of that there is a quota imposed on the schools, a requirement to take a certain number of students, which is a reality of life with the population increase in Saudi Arabia. But this usually works against the expected quality. We are not equipped to treat equally any number of students. Therefore architectural education is not able to respond to everyday demands that keep increasing. I don't think this is necessarily a shortcoming of architectural education. It is just that architectural education has a different nature from what is expected of it in this area. This is maybe mostly peculiar to Saudi Arabia, because of the phenomenal population increase we are experiencing at the moment. This is going to make things worse and not better. We cannot do additional screening, set additional aptitude tests. We have to take whatever comes out of the high schools, and that upsets the whole system of quality control. Having said that, one must admit that there is still a responsibility for the University to find a way of rehashing architectural education from the admission to the end, with the realities of this in mind, the realities of the country and the nation. In this respect we do have a responsibility.

Researcher: *What do you teach in the School?*

Ustankok: Design studio, History, Architecture Programming, Conservation.

Researcher: *What is your opinion about the design studio?*

Ustankok: I have the relative luxury of teaching the final year student. The reason I say the relative luxury is because I am able to expect my student at that level to have absorbed all the necessary parts of the curriculum relating to the technicalities of architecture. So the end projects that they do in the final year (9th, 10th) must reflect all these things that have been taught to them, and they should be able to give a good synthesis to all of this. Yet at the same time the structure is collapsing because the construction is not there. Environmental control, even the basis of it, is lacking, so it takes a lot of effort on our own part or that of whoever is teaching the final year studio to put everything back into their concept.

Researcher: ***Why is it like that?***

Ustankok: My personal conclusion is that there is perhaps a cultural tendency to compartmentalise things. Like when you examine one of your students in any one of these components of the curriculum they know everything. Like if you examine them on environmental control systems they know everything, but they do not know how to use the information. But maybe it is a cultural tendency to keep things in their proper pocket rather than mix them together and do something else with them. I am not saying that one hundred percent of the students are indifferent to these things. This is maybe due to their total indifference to the profession, because they found themselves in the schools studying architecture and don't care for architecture all that much. Some of the students are not cut out for architecture to start with. So they are not able to synthesise these things together.

Some of the students are very good students, who can recite things, memorise them and give them back to you in theoretical courses beautifully. But this is not the sort of attitude you expect from the students in the design studios. In the design studio you look for initiative from the students, you need inquisitiveness, you need efficiency. All these things are not part of the early training of students, who are basically much better at memorising. That makes them good engineers, I am sure. That makes them good medical professionals, I am sure. That makes them very good lawyers, I am sure. But those assets of the students are good in other fields of education, but not necessarily in the design studio, where a different type of mental activity is required. And I don't see any other way of producing a design project without the students synthesising all the information that is given to them in the curriculum.

That brings us back to the point that we mentioned earlier about the curriculum: it is all there, all the ingredients of the soup are there but the soup is not there, so where is the mistake? I think probably it is a number of things. There is not a single reason, and I am not someone who can give you all the reasons, but I am looking at architectural education from a limited perspective.

Researcher: ***How about the cultural context of architecture?***

Ustankok: They are all there in the curriculum. I am responsible for teaching History of architecture.

Researcher: ***The students don't see the value of this subject or the role it plays or should play in design. Why do you think this is so?***

Ustankok: I am teaching History One, which is chronologically organised and has really no relevance other than to introduce the architectural principles that have been applied in the architecture of the past. I make a strong point of emphasising this to my students and I am sure that whoever has taken History One from me knows that this is the way to learn from history. I do not teach the style; that is an old-fashioned way of teaching history, which has been abandoned thirty or maybe forty years ago. What you teach in Architectural History is architecture itself. You are using history as a vehicle to give the students examples of how to make use of these principles. If an ancient Egyptian temple is a good example of axial planning, for instance, this is what should be emphasised, not the style of the columns etc. That is a by-product of the course.

Researcher: *Do you give the course in English?*

Ustankok: Yes.

Researcher: *Do you think language is an obstacle to student understanding?*

Ustankok: It has become more and more of a barrier between me and the students lately. In the ten years I have been here the students used to speak better English in the earlier years. Because of the sheer number now the English Department is not able to cope with the pressure, and you cannot make sure that everyone learns a workable level of English at the end of the year. And the high schools really are not able to cope with it.

Researcher: *How about building science and technology, such as environmental design, structure, construction, etc. materials?*

Ustankok: We have touched upon these issues. They are the responsibilities of other departments. In some of the areas a new look is needed, not in the way they are given, but in the way they are put together.

Researcher: *What do you mean by that?*

Ustankok: Take for instance the relationship between the structural concept and construction material. You cannot really separate the two, and if you are dealing with the building envelope you cannot really isolate them from the means of environmental control. So these three things should come together, but we ordinarily expect to separate them and expect the design studio to be the place where all these things come together. But I have a feeling that perhaps within each of these courses there might be a better correlation and co-ordination, so that the students would be less inclined to keep them as separate courses in their minds, and to retain as separate areas the information gained from them, which doesn't come together on the design table. So if we can co-ordinate them better and put the relationship between the courses more vividly in the minds of students then the students will be able to synthesise the information in the design studio.

Researcher: *How about the presentation of the project (visual and oral communication, model making etc., writing reports)?*

Ustankok: I think the number of students that the School is faced with in the first year of this College when all the design communication skills are taught is too great. The number of students to faculty has become a negative ratio over the years due to the large intake. So we are not able to do as much as we used to improving the students' abilities in the areas of graphic presentation and graphic communication etc. So the students today are not as good as they used to be ten years ago. I know that from the level of presentation that we have now compared to the level of presentation when I first came to the School ten years ago. It has dropped dramatically due to the sheer numbers of inductees in the first year. The same thing may be concluded about English. English teaching is the same, but the numbers are different now. This theory applies to every level of teaching; the teaching quality is the same but the number does not allow the quality to be absorbed by each individual student any more, because there are more students to cope with.

Researcher: ***How about professional studies, such as economics, management, legal systems, etc.?***

Ustankok: Those topics are grouped into two courses - Professional Practice and Costing and Estimates - covering all the bills of quantities, all the specification, and all the legalities of practice. We often have a shortage of manpower to teach these courses. Here we need someone who knows professional practice and the legalities and liabilities of an architect, the building codes, and the fire regulations. So if this information is not covered then the number of courses is not enough, and the content of these courses is less than what could be offered.

Researcher: ***At the end of this interview do you have any comments you wish to add?***

Ustankok: Yes, one last thing, architectural education in Saudi Arabia is highly standardised in terms of curriculum contents. Like, for example, it has to have a certain number of credit hours, which cannot be less or more than that. If the number of required credit hours for a Bachelor's degree in Architecture is 172 then you cannot have a student at the end of his five years having accumulated 182. That is not allowed. It means that the students are not allowed to take any extra credit hours or courses than what is prescribed for him. The 172 prescribed credit hours include the electives. That in itself does not allow any manoeuvring, however much you play with the courses within it. This straightjacketting of the number of credit hours is something that works against flexibility. The curriculum is much too fixed to do anything about. So even if you want to offer more courses in the areas where we find shortcomings it is not possible within the arithmetic of the system that is enforced. The School cannot increase, decrease, or modify the course of study because it is imposed by the Ministry of Education.

Researcher: ***The credit hours are different from one school to another?***

Ustankok: I think a few years ago they have been standardised for all schools.

Interview 18

Ishteeaque, Ellahi M.

King Fahad University of Petroleum and Minerals

Researcher: ***I know you have practised architecture as well as doing some teaching. Can you tell me briefly where you have practiced?***

Ishteeaque: I have practised in Florida – resort architecture, commercial residential communities, Walt Disney, Montgomery World, Sea World.

Researcher: ***Do you think that there is a gap between architectural education and practice in Saudi Arabia?***

Ishteeaque: Yes. I think there is a big gap. One of the reasons is that most teachers in the School of Architecture in K.F.U. have had a very limited work experience. This is not a criticism but a factual observation. All the teachers have received a top education; they have the ultimate degree in architecture. But if not all of them, indeed I would say most of them, have never worked in a real life situation. So what is happening out in the field is one aspect from which they are isolated. Once they come here and teach they will not be able to respond and relate to problems addressed in the real world.

Researcher: ***Can you tell me something about the curriculum at your School?***

Our programme in K.F.U. is burdened with other courses, whereas in the architecture courses their loads and numbers have been reduced. I am talking about courses such as Maths, Physics, Islamic courses, humanities courses. In other parts of the world the architectural training programme is at least six years, and after that, graduates pass an exam. The overall training period is at least nine years of education and practice; six years of education, three years of office work, and then a professional examination. This long duration of education and work practice tries to fill that gap. But in this School we have a four-year programme.

To make things worse the number of credit hours has been reduced. It has been reduced because this School is a part of a very technical environment. All other programmes are one 130 hours, and the Architecture programme is 150 hours. It used to be 180 hours. They have reduced it because we always have a smaller number of students than the programme. The administration has said that the reducing of credit hours will help. The students here are very concerned when they compare the Architecture programme with other programmes. So the credit hours had to be reduced to 130. Within the 130 there are other courses that are required from the cultural point of view, such as Islamic Studies and Arabic. In our programme there are 27 credit hours that are not related to architecture, which cuts down the exposure of the student to the course of architectural education. It is like a three-year programme.

Researcher: ***What about summer training?***

Ishteeaque: We have a summer intern programme. But the students go and work any place, not specifically in an architecture office in which they would learn something more related to the field. It is just a fulfilment of a requirement. This softness of regulation does not help.

The architecture curriculum should have a mandatory slot for training. Before he qualifies as an architect a student must do a one-year training, and after that the student should return to the School to do the final year. Definitely you will find that the student who has had exposure of one year's internship outside the School in a real architecture environment is going to do much better than the student has not done that.

Interview 19

Rageeb, Thamir

King Fahad University of Petroleum and Minerals

Researcher: *Can you give me some information about your educational background?*

Rageeb: I gained my B.Arch. from King Fahad University, and I went to the USA, specifically to the University of Colorado at Denver, where I gained my Master's degree. And then I went to Cardiff in Wales where I graduated Ph.D. in 1996. I am currently Chairman of the Department of Architecture at King Fahad University.

Researcher: *Do you think that there is a gap between architectural education and practice in Saudi Arabia.*

Rageeb: Yes, I vehemently agree, and I am sorry that it is there.

Researcher: *What is the effect of this gap, in your opinion, on the student?*

Rageeb: First of all the graduates will take more time to grasp the technicalities of architecture and to become professional architects. Secondly after graduation the students have no confidence in themselves, and their employers have no confidence in them. The students in the School lack the correct procedures that a project goes through in a real practice, from the meeting with the client all the way to handing the documents over to the contractor. Our students do not take into consideration economic factors. The teachers think that considering building costs will limit the students' imagination.

Researcher: *Do you think that your students take into consideration the structural factors, construction details, building science and technology, and so on?*

Rageeb: I will tell you the situation truthfully, and I will not praise our programme at the expense of your research. Here in our College we have two programmes, one Architecture and the other Architectural Engineering. Here in the Department of Architecture we focus on the design issues, you know, floor plans, elevations, forms, the general appearance of the building, and we do not take into consideration the structural or mechanical and all the other things you said. Sometimes our students use one system of structure in their designs, say reinforced concrete, in a project where a steel structure is more appropriate. When we ask them in the jury why they chose concrete over steel or maybe some other material, the students are completely confused.

Researcher: *Do you have any comments you would like to add about the effect of this gap on the students?*

Rageeb: Yes. Our students have weaknesses in their architectural presentation techniques. I don't know what more I can tell you. As you know, the situation is endemic here, and I don't know why. I think maybe the students that we admit are getting fewer in number. The teaching staff numbers are also dropping, now that we have only seven teachers. We are trying to compensate for this shortage by focusing on computers. We want our programme to be computer-oriented and we want our students to be special in their computer abilities. So we offer the students programmes in computer aided designs, computer programs on CAD, animation, rendering, structural programmes, architectural presentation, etc.

Researcher: ***In your opinion what is the cause of the gap between training and practice?***

Rageeb: The duration of the programme is absolutely too short. The degrees we offer are professional degrees in architecture equivalent to the accredited programmes in architecture in the United States, which take their students at least eight years to complete. However, the duration of all the courses in the University here is five years. The first year for all students here is an orientation year. So the School is left with four years only to train architects. Our programmes are a hundred and fifty-five credit hours per semester, which we have to cover in four years. The student then will have a load of nineteen to twenty-one credit hours a semester, which is an impossible task for a student to handle. So we have to eliminate subjects and split others and distribute the contents between other subjects. In the curriculum there are also some subjects which are of little or no relevance to architectural education, such as physics, mathematics, and chemistry. We have to satisfy some of those because they are College and university requirements, which also reduces the length of time we can spend on the core subjects.

Researcher: ***How about the structure and content of the curriculum?***

Rageeb: There are some inadequacies in the subjects required for the training of an architect, such as subjects on site supervision, construction management, and specifications. Our students do not know how to write specifications, or even how to do this with the aid of a computer. They do not know how to read a bill of quantities, much less to write one. Our excuse here in the School is that the duration of our programme is only four years, but I don't know about other universities which have course of longer duration.

Researcher: ***How about the physical academic environment?***

Rageeb: The physical academic environment in King Fahad University is excellent. Everything is available and accessible and all the labs are equipped with the necessary materials and technicians. We have a structural analysis lab, a building science lab, a model workshop, etc., and labs are always incorporated into the teaching of the subjects, which has a very positive effect on the student.

Researcher: ***Do you have any thing you want to say about your students?***

Rageeb: The students who come to King Fahad University are usually ambitious students. The students, however, will not enrol on our programme because of the job market; there are no jobs available.

Researcher: ***Why do you think the numbers of your students are fewer than in other parts of the country?***

Rageeb: Relatively speaking our numbers are no worse than in other universities. King Fahad University only has a total number of 7,000 students, and of these forty-three are studying architecture. King Saud University has a much greater total number of students, and also a greater number of architecture students, but the percentage of total students they make up is about the same as here

Researcher: *Do you require any practical training prior to graduation?*

Rageeb: Yes, we do. We require a period of practical training at the end of the last year. The training, however, is only eight weeks and it is very poor. The students go to a practice office, but they have no systematic training there; they just pass the time with anything.

Researcher: *Do you have any other comments you wish to make?*

Rageeb: Yes indeed. The first comment is about textbooks. The problem is that we have no textbooks that are relevant to the Saudi situation. In other countries they have text books on working drawings, on specification, on detailing, and so on, and each of these topics is dealt with in a way that applies to that particular country. There is therefore no problem with teaching material appropriate to the country concerned, since everything is there to hand. We don't have this advantage. Furthermore in Saudi Arabia there should be a professional body to examine the architects after they graduate and grant them a licence to practice.

Interview 20

Siddiqi, Anis A.

King Fahad University of Petroleum and Minerals

Researcher: *Can you give me some information about your educational background?*

Siddiqi: I gained my B.Arch. and Masters from Pakistan in 1964 and 1969 respectively. After that, I studied in Sheffield where I gained my Ph.D. I taught architecture in King Abdul-Aziz University then in King Fahad University. I spent more that seventeen years in Saudi Arabia teaching architecture.

Researcher: *Do you think that there is a gap between architectural education and practice in Saudi Arabia?*

Siddiqi: There is always a gap between the theoretical training that a student undergoes, particularly related to a profession, and the practice, whether it is medicine, engineering, or architecture. Indeed there is a bigger gap between architectural theoretical training and practice. There are many reasons for that, but one major reason is that architecture is an ever-learning profession because it is primarily a creative profession. There is hardly any textbook that a student of architecture can actually memorise. Because architecture is creative thinking, there is no limit to it and there will always be a gap. This gap exists all over the world. Coming down to issues related to Saudi Arabia, this gap is wider and much bigger. The reasons are many. Education and training in architecture is comparatively new to society. Saudi Arabia started the schools of architecture during the 70s. Architectural education, therefore, came much later compared to other professions such as medicine and law.

Another reason is that, because it came much later, pre-university education never had anything in their own curriculum and syllabus to prepare their students for what they would meet in an architectural career. They had plenty of emphasis on engineering, social sciences, and medicine. But up to now there is no school curriculum in the kingdom that actually emphasises architecture as a practising profession. This is one of the major reasons why the gap is there. The students take a long time to understand the profession and the professional implications of architecture. So they inherently fall back compared to other students.

One dominant reason is that architectural education is given in English. The training in language takes a substantial amount of time. So effectively a year or two is lost completely in preparing the student for English. So a five-year architectural education is effectively just four years. Four years of education in architecture is not a professional degree.

Researcher: *What about the role of the teacher?*

Siddiqi: The role of the teacher in education is paramount. In an abstract manner the teacher's ability to teach, his own understanding of the profession, his own experiences in the profession, are definitely a strong influence on the overall training of the student. In many countries elsewhere in the world teachers in architectural education are allowed to practise. So they bring back into the studio and into the class a professional experience of practice, of architecture. Unfortunately it is not allowed in the Kingdom of Saudi Arabia. So the Saudi faculty are not allowed to practise and thus they have their inherent difficulties.

Where the Saudi faculty does not have the practical experience, at the same time the non-Saudi does have this background in practice, but they don't have the requisite background in culture and social issues. So they cannot understand the peculiarities of society as such. The result is that they end up teaching a lot to the student but the student is not able to deliver that in the field, because his knowledge and ability to comprehend things is out of the frame of practice in Saudi Arabia. That is the dilemma most students go through. My seventeen years' experience in the Kingdom has enabled me to adapt to this difficulty, although I can never act as a Saudi acts, having lived here for a long time, longer than anywhere in the world. I have adapted to these trivial intricacies and deficiencies. So I tried to speak the cultural language of Saudi Arabia, the religious language, in order to come down to the level of the student, down to the social and cultural values, and then transfer and transmit the issues of design so that they can understand and grasp them. It is true that the teacher's ability and his personal background and personal experience in his field are definitely a valuable asset to him. If teachers are allowed to practise or at least get involved in professional activities it will undoubtedly be a great benefit to the student and to architectural education.

Researcher: ***How about the students?***

Siddiqi: As to the students' motivation, there is a pull mode from the teachers that actually pulls the students into the learning process, and there is also a push mode where the student actually pushes himself into motivation. The student's motivation arises out of many reasons, one his own personal training from the schools and his family background. The other reasons are largely profession oriented, jobs oriented, and economics oriented. If the economic situation is such that the student has no hope of getting a good job then his motivation will drop. There is a need to educate the student that, if today there is less chance of a good job, then there will be jobs in three or four years.

On the social and intellectual level it is important for the student to know that what he is doing is valued in society. Now architects as professionals are being taken in a better way than they were taken ten years ago. The RIBA protects only the title of architect, though anybody can design, but nobody can call himself an architect unless he conforms to the requirements of the RIBA. On the other side of the Atlantic the AIA does the opposite. Anybody can call himself an architect, but he cannot be registered as a designer.

Taking this thing into our social context, because the general masses have never known what the architectural profession is all about there is no weight as far as being an important member of society is concerned in being an architect. Architecture is practised by the client himself, or anybody in that sense. The role of the user is paramount; he dictates what he wants. Sometimes he will ask you to draw like he wants. The architect thus works like a professional draughtsman. I don't see anything wrong with that as long as it becomes a process of evolution. The client, the user, and society at large will understand the usefulness of the architect, and the architect will understand the intricacies of design. Over a period of time the architect will develop and get his much needed respect, but I don't think it can be forced on to society. Because society is evolving itself and it will take time. I don't see it as a problem that clients are dominating architects. What actually bothers me is when other professional such as engineers and draughtsmen, and untrained people come into the field and call themselves architects.

Researcher: ***What do you feel about the architecture curriculum in your school?***

Siddiqi: As far as technicalities are concerned, they are not intentionally ignored or omitted. The problem is basically the time factor, the overall time available to the teacher, the contact hours, and the overall environment and atmosphere within which teachers and students are working. So there are always trade-offs: should a teacher emphasise technicalities over a genuine understanding of a problem and genuine solution, or vice-versa? This is a very delicate issue that could be debated on and on. I am convinced that, at the end of the day, what we as teachers of architecture can give to students is not the ability to design a practical building and construct it in the field. I would rather see my students understand the problem, analyse the problem, and bring forward even a hypothetical solution to the problem, because if a solution is proposed it can be made practical one day. I think that a philosophical approach to the solution of a problem is more important than being able to design a building that can stand, but does not function properly.

We have to make sure that we understand materials, construction, structure, lighting, and environmental control systems. But if they become too technically oriented and abandon the very essence of architecture, which is the basic understanding of the philosophy driving the approach to design, this I think is a losing trade-off. I would rather want the student to learn more imaginative thinking. This where we draw the line between the architecture programme and the architecture engineering programme.

I think that it is very important that the student learns before he graduates the legal and practical intricacies of the profession. But again, as I said, in a very compact course which effectively runs for four years of architectural education, there are limitations that we have to trade off between the practical issues and the issues of design. What I suggest here is that at the national level there should be a committee so that it can settle the emphasis between practical issues and design in the schools of architecture.

Researcher: *Can you tell me something about the School facilities?*

Siddiqi: There is certainly an imbalance in this respect. My personal experience from Jeddah tells me that there are too many students in that school. The usual intake is over a hundred students per year, more than the capability they have to support practical issues like technical workshops. They don't have the labs to support the practical education of the student. On the other hand at K.F.U we have the opposite of that situation; our intake of students has gone down over the years. This School was initially designed to take from a hundred to a hundred and fifty students per year. The network of laboratories is well developed. We have good labs on acoustics, environmental control systems, structural analysis, and lighting, and model making workshops. Unfortunately, because of the reducing number of students in the intake, the efficiency of these labs has dropped. There are fewer and fewer students available and their orientation to these labs is less practised. There are only four students in a class.

King Abdul-Aziz University draws students from the Western Region. The Western Region is the most populated area of the Kingdom. So there is a greater mix of students of varied backgrounds, from rural to urban backgrounds. King Abdul-Aziz University is not a one hundred percent residential university. Most of the students are day scholars. Most of them don't live on the campus, whereas architectural education is a full-time business. Most schools in the world will be open to architectural students twenty-four hours a day. Most architecture students feel happier working during the night hours than during the daytime. But because of security and other things the buildings and the School of Architecture in K.A.U. in particular are not accessible to student during the night time.

On the other hand if you look at K.F.U. School of Architecture there is some sort of a family network. K.F.U. is a full residential university; all the students live on the campus. By contractual obligation the faculty has to live on campus. In K.F.U. there is so much proximity between teachers and students day and night, including the use of laboratories. This has created a kind of innovative and creative environment in the School of Architecture.

I always tell my students that they can call me at any time day and night. Last Ramadan the students were having problems in design. They called me at two in the morning. I came to the students and I worked until seven in the morning. This thing is not possible in K.A.U. This has contributed tremendously to the overall performance of educational background in K.F.U. This is one of the major reasons that this University can boast of higher achievement, because they provide both the students and the teachers an environment in which they can actually work as a team. This is where I think K.F.U. has an advantage, one provided by the system.

APPENDIX II

INTERVIEWS WITH STUDENTS

Group Interview 1

King Saud University

Interviewees:

Assaf, Fahad
Faris, Anas
Gadair, Iead
Ghanim, Mohammed
Jamaz, Khalid
Musharif, Aiman
Zimindar, Abdul-Aziz

Researcher: *What are your feelings about the curriculum?*

Faris: There are many subjects that need to be eliminated from the curriculum. Likewise there are others that need to be added. The subjects that need to be eliminated have no benefit to us and do not serve us in our future careers. After we study them and pass the examination we find ourselves forgetting everything about them in the next semester. Those that need to be added are those which are related to professional practice. Also we need to be more prepared in English language. We cannot read foreign books. We only studied a three credit-hour courses in English and it was not related to architecture.

Assaf: The subjects of the curriculum do not complement each other. Some subjects have different titles, but because there is no co-ordination between the teachers you find the content of these subjects is similar.

Jamaz: That's true. The content of the subject <u>does</u> depend mainly on the opinions and inclination of the teacher. But sometimes you find that this has the opposite effect to that just mentioned by my colleague. If the teacher of the subject is changed from one semester to another, then the content of the subject is changed as well although the name of the subject remains the same. So the content of some of the subjects that we have studied is completely different from the same subject that our colleagues studied the semester before.

Researcher: *What role do the students play in the make-up of the curriculum?*

Assaf: The student unfortunately has no voice on what he is studying and his opinion is never consulted.

Researcher: *How about the teachers?*

Zimindar: The teachers are not sensitive to our problems. With the routine and the teaching load, teachers do not have the time or the inclination to sit with us and listen to our needs.

Jamaz: The teachers think that there is only one road to success, and that is listening to the teacher's lectures, writing them down, memorising the handouts, and then taking the written examination on this basis.

Zimindar: In Landscape, the teacher asked us to memorise different plant and tree names and some information about them for the examination. The exam was an oral one. The teacher showed the student photos with the slide projector and the student had to identify the name of the plants. The teacher, therefore, gave us the slides to prepare ourselves for the exam. The names were difficult. They were in English.

Musharif: These plants do not grow in Saudi Arabia.

Zimindar: Yes, so what we did is this. We tried to identify a landmark in the photo which was similar in pronunciation to the name of the plants, a sort of mnemonic device, such as distinctive car, or a passer-by, etc. We passed the exam, yes, but we have forgotten all about this subject now.

Faris: I want to add something. In our school, the teacher always evaluates the student, but there is no mechanism through which the student can evaluate the teacher and his teaching capabilities.

Researcher: How about the teaching methods?

Faris: Too reliant on classroom work, for one thing. Let me give you an example. We studied architectural detailing in one course only. Now I am a student at this School but I also work in an office in the evenings, and I can tell you that there is dissimilarity between what we study here and what is used in practice. For example, I studied reinforced concrete structure here in the school, I passed the exam and I gained an 'A' in that course, but we did not see how it is constructed in practice. We studied on the blackboard how the steel should be arranged etc. but we did not see it in practice, nor in photos, models, nor on the site. The School should take us to a construction site or use photos, models and labs to make the theoretical information we are taught more tangible and comprehensible.

Zimindar: Even the terminology the teacher uses in the class is different form the ones used in practice.

Musharif: Yes, words like "Ta'shish" and "Shad Al-Khanzirah". These things are not taught in practice.

Assaf: History of Architecture is taught to us in terms of slides and memorisation of floor plans and elevations.

Researcher: How do you view professional practice subjects?

Ghanim: The success of teaching these subjects depends on the teacher. If the teacher is in touch with practice then the teaching is practical and pragmatic. And the content of the subject is taken from the real world of practice. However, if the teacher does not practise then you will find the teaching too academic, abstract, and theoretical in nature. You will find the content of the subject has no link with practice.

Researcher: How about Project Management?

Ghanim: We studied this in a theoretical way with no link to the world of practice. We studied how projects should be managed from foreign textbooks, not as projects are handled in here.

Assaf: We don't know yet how to meet with real clients and understand their wishes.

Researcher:	*And Architectural Programming?*
Musharif:	With regard to Architectural Programming we have studied this adequately enough in the design studio, especially now that we have been involved in our graduation projects, where we spent almost half of the semester in this issue.
Researcher:	*Can you tell me about your preparation in building economics?*
Gadair:	Our design project here is not real, so we don't take into our consideration when we design the project how much it is going to cost or whether it is a feasible proposal. There is no time for these tasks in the design studio.
Researcher:	*What about the design of plans and elevations?*
Gadair:	Yes, we are very well prepared in this matter. We spent most of our time on this issue in the design studio.
Researcher:	*How about building technology, such as the selection of a suitable structural system, air-conditioning, plumbing, electrical methods, etc.?*
Ghanim:	We are absolutely in the dark about these matters.
Researcher:	*Why?*
Ghanim:	The problem is that there is no integration between the theoretical subjects themselves, and there is no link between these courses and the design studio. Also the quality of the teacher, by whether he practises architecture or not, determines the quality of the course. For example, when we studied mechanical systems with a teacher who was out of touch with practice, the information we were given was old and not relevant to the reality of practice in Saudi Arabia. There are new air-conditioning systems in the market now. But the systems we studied were old. The content of the subject remained the same for twenty years. The handouts we are studying from now are the same handouts that were used fifteen years ago.
Assaf:	The mechanical systems we study in the school, whether old or new, are not used in Saudi Arabia anyway.
Ghanim:	I will give you one example to show you that there is no integration between the subjects of the curriculum and the design studio. I was supposed to study the mechanical course in the third year. However, I did it in the fourth year, the same year we did the System Design studio. In that particular studio we were suppose to do a design for a project and to do the working drawing and architectural details of the project, including the selection of the air-conditioning system. So I tried to apply the knowledge I was learning in the mechanical course, such as the selection of the air-conditioning units, the sizes of the ducts, the location of the openings, etc. The teacher of the design studio, however, asked me to do it in a different way.
Zimindar:	There should be a teacher from every subject teaching in the design studio.
Assaf:	We notice that there is a conflict in the opinions of the studio instructors. Each one of them gives you different concept of what is required. One instructor asks you to go in

one direction and another asks you to go to the opposite one. There is an individuality and no co-ordination between the teachers.

Researcher: *Can you tell me about the physical academic resources, labs, library, and so on?*

Ghanim: We have all the labs any school would dream of. But in five years we have visited these labs only once or twice.

Assaf: When we ask the teachers about the labs, they tell us go with the teaching assistant and he will show it to you. I will give you one example of their attitude to labs. Although we have a fully equipped structural lab the teachers never took us to it. When the structure teacher wanted to indicate to us how a reinforced beam would perform when exposed to certain forces, he used a role of drawing papers to show us.

Jamaz: Also our visits to labs are not credited to us towards our final grade of the subject, so there is no encouragement for us to go to the lab and use the equipment.

Gadair: The students have no say in the environment in which they study. The School took part of the reading section in the library and converted it to a research centre without consulting us.

Faris: There are no textbooks from which we can study. We depend mainly on the teachers' handouts.

Zimindar: There is no privacy in our design studios.

Gadair: We would like to stay longer studying in the School, but the environment of the School does not encourage us. There are no lockers, for example, where we can leave our belongings and drawings safely.

Researcher: *Having established through out discussion that there is a gulf between architectural education and practice, could you tell me about the causes of this gap?*

Jamaz: We feel that the college has no lucid goals towards which the students are directed. What is happening now is an individual effort by the teachers.

Gadair: The Saudi teacher has minimal experience of the world of practice. He has also no experience or minimal experience of teaching. He might know the information but he does not know how to convey it to us. The foreign teachers are better but they are quickly replaced by Saudis because of the government Saudi-isation policy.

Musharif: Each school of architecture in the country should adopt an educational and architectural philosophy different from the others. One school, for example should put more emphasis on computing, another on Building Science and Construction Management, another on architectural theory and philosophy, etc., so that if a student wants to specialise in site supervision and construction he can go to school A, and if another student wants to specialize on computer aided design he can go school B and so on.

Group Interview 2

Umm Al-Qura University

Interviewees:

Amri, Husain
Bin-Mahfoz, Mohammed
Hashimi, Omar
Khaiat, Mohammed
Najar, Abdullah
Nawawi, Midhat
Zaidi, Othman

Researcher: *Let me first ask you what you think of your curriculum in general terms.*

Bin-Mahfoz: It is hard to see the relevance of some of it. There are some subjects in the curriculum that are of no importance at all, such as Calculus, Physics etc. But there are some subjects which we took in the last two years which we wish we had studied earlier.

Nawawi: Also some of the subjects that <u>are</u> relevant seem to be poorly designed. In Structure for example, there are too many courses but too little benefit, and Project Management and Construction Management were long subjects that we studied in a very short time and we couldn't fully comprehend them.

Khaiat: The most important thing from the teacher's point of view is to cover the syllabus of the course but he does not have the time to do so. The duration of the course is too short for the amount of information we get. That is why we cannot study and digest the information we get from the courses in order to apply it in the design studio.

Researcher: *I am going to ask you about some specific topics and subjects. How are you prepared in project administration (meeting with the client, analysing the requirements, office management, etc.)?*

Zaidi: In the University, we use for our design an ideal site, an ideal client and almost no constraints at all, such as building laws and regulations, budget etc. In reality, however, there are building constraints that need to be met. Most of the sites, especially in Makkah, have irregular shapes. The clients have demands and requirements that need to be fulfilled. There are building laws and regulations that need to be satisfied. And then there is a limited budget that you need to work within.

Khaiat: Admittedly in the Professional Practice Unit we designed a real project and we sat with a real client and wrote down his requirements. But we don't study how to manage an office or how to work with other architects and engineers.

Najar: In practice the client is not very much concerned with the appearance of the building as much as he is concerned with the cost of the building and the amount of investment he is going to get.

Researcher: *What about site supervision?*

Hashimi: No, we did not touch on this issue.

Researcher: *How about architectural programming?*

Amri: In the early years the teachers used to give us the programmes but in the graduation project we did the programme.

Researcher: *And Architectural Drawing?*

Zaidi: Yes we have been very well prepared in this matter

Researcher: *What about working drawings?*

Najar: We did a set of working drawings in the Professional Practice Unit. The working drawing of the new campus of the University helped us to complete our own working drawings.

Researcher: *Are there adequate facilities like workshops and labs?*

Hashimi: We did not use these facilities at all. The courses were all theoretical.

Najar: What is more, the computer lab is always closed except during the lectures.

Researcher: *How about the teaching methods used in your School? Did you find some inadequacies?*

Amri: Yes, most of the time the teacher does not make sure that we have understood the lecture. We don't feel the value or the importance of some subjects, and after we do the examination we forget every thing.

Hashimi: Sometimes the teachers in the design studio say to me, 'Didn't I teach you this?' The implication being that if I had understood the piece of the information the teacher gave me I would not have forgotten it.

Najar: As far as teaching is concerned, we need more emphasis on English Language. We found shortcomings in our abilities to communicate with the English language.

Researcher: *What are the inadequacies that you noticed in yourself while taking your practical summer training?*

Zaidi: Structure was the subject that I found most shortcomings in during my summer training.

Amri: Also design, when you take into consideration the practical and economic aspects. When we went to work we were always thinking about the form, perfect solutions, and perfect circulation, but in practice we had to think in a different way. We had made some sacrifices in the form in order to reach optimum solutions that were integrated with the practical and economic requirements. In the School the form and prefect solutions are emphasised. But when we worked in practice during our summer training we were told that, in order to arrive at an optimum working design, the architect must make some sacrifices in the form.

Hashimi: When we had our training the architect who was working with us told us that we had to put aside what we had learned in the school so far, and that we should start from scratch.

Researcher: ***It seems that we have established that there is a gap between architectural education and practice. Where do you think the problem lies?***

Najar: I think it has to do with there being no link between the teacher and the world of practice. Take, for example, the teaching of Structure, which is problematic, as some of us have mentioned. The best teacher we have ever had was Mr. Isam. Because he works in the Project Management Department in the University, he is practical, and because he is practical he teaches us the information we need to know when we start our career after we graduate.

Nawawi: Yes, there must be a link between the teacher and the world of practice. The benefit is that we can widen our horizon from our interaction with a teacher who is practising the profession, who has practical experience about what is happening in the real world.

Khaiat: The teaching is theoretical, without site visits, without knowing what the different building materials in the market are.

Amri: The projects that we do in the university are not what is required in the market today.

Bin-Mahfoz: Architectural practice as it is taught in the school is not in harmony with reality. What we are studying is not used in practice.

Group Interview 3

King Faisal University

Interviewees:

Ajmi, Abdullah
Atiah, Amar
Kazim, Hani
Zinaigeer, Badran

Researcher: *Having completed your summer training, do you think that there is a gap between architectural education and practice in Saudi Arabia?*

Atiah: Yes, this is true one hundred percent.

Researcher: *How is that?*

Atiah: In the school the student is free to do whatever he wishes, but in practice there are design constraints that need to be taken into consideration, such as the fact that the types of heat insulation required by clients may be new in the market, but these things we do not study in the School. There are things that are new in the market but the school is not aware of them. In other words, the School is not up to date with practice.

Researcher: *I would like to ask you about different tasks that are often performed by architects in practice. I would like to know how well you think your School prepared you to perform these tasks. I will start with Project Management.*

Ajmi: We studied two courses in Project Management, covering costing and working drawing. But we have not used the information we learned and we have not seen them applied, for example how an architect meets with a client.

Kazim: We also did not study how to write contracts with a client, or how to write reports. The School did not teach us how to obtain building permits, though this is something that is required for any building. But we did not study anything about this – the paperwork required, who we should contact, etc.

Researcher: *How about Architectural Programming?*

Zinaigeer: Yes we did this. And we are doing it in our graduation project. We have not been taught how the budget influences design. We did not study how we should write a contract with a client and what should go into the contract. We studied these things theoretically but we are suffering for the lack of live case studies.

Researcher: *How about site analysis?*

Zinaigeer: Yes we do site analysis for our project in the design.

Atiah: But we do the site analysis after we finish the design, because it's one required sheet.

Researcher: *How about cost analysis?*

Ajmi: We studied one course and we applied it in a house that we designed. The teacher who taught us this course was a excellent one. He was Greek and he was in demand by the local offices for his working experience. It was an excellent course.

Researcher: ***How about the production of architectural drawing?***

Zinaigeer: After we finish the design, all we have to do is produce the architectural drawing, so there is no emphasis on working drawing in the design studios.

Researcher: ***In your designs to what extent do you take into consideration the social, climatic, and economic considerations?***

Kazim: The most emphasised part in the design studios is the social and functional. The climatic comes after that, in terms of emphasis. But usually we don't take into consideration the economic factor, like how much the design will cost or whether there is a cheaper way to express the same idea.

Researcher: ***How about structure? Do you feel confident that you can choose the right structure for your design?***

Kazim: No, I don't think I am really confident in making this choice. We mostly used reinforced concrete for our designs, but sometimes I wonder if there is another structural system that would be more suitable, for instance a steel structure or a wall-bearing one.

Researcher: ***How about construction and site supervision?***

Zinaigeer: This is not covered in the curriculum. We haven't studied this.

Atiah: We always wanted to go to a site to see how buildings are constructed, but unfortunately we did not do that. For example, we take in Construction how the roof should be constructed, like after the slab there comes the water insulation, and then the mortar, the tiles, etc. But we wanted to see with our own eyes how this was done.

Researcher: ***Do you apply building laws and safety regulations in your designs?***

Ajmi: We only apply setback regulations.

Atiah: The Saudi building laws and regulations, as required by municipalities, are not covered anywhere in the curriculum.

Researcher: ***Are you required to produce any architectural details or specifications in the design studio?***

Ajmi: We have never been asked to do any specifications of bills of quantities or anything like that. Sometimes the instructor in the design studio asked us to provide some architectural details, but we copied them from graphic standards books just before our final presentation.

Researcher:	*There appears to be a gap between your architectural training and practice. What are the causes of this gap? The curriculum?*
Zinaigeer:	Some of the subjects needed to be redesigned, for example the History and Theory of Architecture. There is no need for this subject; we studied Greek and Roman civilisation, and this is of no relevance to us.
Kazim:	Also in the teaching of the subject of Structure what we are studying now is only calculations, but we don't know how to choose the right structure like architects do in practice.
Atiah:	There are some technical subjects that we don't know the value of, such as lighting, and electricity. We know that these subjects are important, otherwise they wouldn't be in the curriculum, but we have never applied the knowledge we gain about them in the studio.
Zinaigeer	The Structure instructor we have now has only had one year's experience; he has recently graduated Ph.D. We had a previous one, Dr. Mohammed Shalbi, who had thirty years' experience in teaching Structure to architecture students, and he used to link structure to architecture, how to choose the right structural system for a design. He used to take us on site visits to see how a structure is constructed. He used to use slides, videotapes, and models, to make the subject really clear in our minds.
Ajmi:	Yes, Dr Shalbi also did not proceed to another topic unless he made sure we had understood the previous one. He used to tell us that if anyone did not understand what he had said he should say so, because if he proceeded the chance would have been lost. He used to say: 'I can use the whole semester just to explain one topic if necessary, rather than waste it teaching ten without any of it being understood.'
Researcher:	*Do you have any comments about the teachers?*
Ajmi:	Most of our teachers don't practise architecture. That is why they always emphasise the appearance or beauty of the building. They also emphasise how the floor plan functions.
Zinaigeer:	The most important thing for the design instructor is the final presentation. If you do a good and impressive design presentation the jury will be happy, and they will reward you with high grades.
Researcher:	*How often do you use workshops and labs?*
Kazim:	Here we don't use the workshops. When we compare our labs and workshops to other universities like King Fahad we see that all the equipment and materials are available there.
Atiah:	In the first year the teachers took us on a tour of the different workshops, and that was it. We have never used them.
Researcher:	*How about the library?*
Kazim:	The library lacks new books and we have no architectural periodicals.

Researcher: *And the computer lab?*

Kazim: We have such things, but the computers sometimes are not enough for all of us.

Researcher: *Any further comments on the physical academic environment?*

Zinaigeer: The building we are in at the moment is a temporary building. There is no privacy in it or lockers to leave our private things. There is no permanent exhibition. Ajmi will take you on a tour to let you see how miserable the building is, and how dire our life in this building is.

Researcher: *Any comments about summer training?*

Ajmi: The summer training is very weak. When we went to our practices we were completely lost; we didn't know what to do.

Zinaigeer: When I had my summer training I felt that the office I was in did not care whether I showed up or not. So I used to go one day and stay away another. But at the end they gave me a signed letter to say I had completed my summer training.

Researcher: *Any further comments?*

Atiah: Education needs examples. The architect and his quality depend on what he sees not what he reads. I wish that the information we get in the courses was supported by audio-visual aids, or site visits, or models. For example, in the Working Drawing course, I wish there were a set of working drawings that we could see, and could note what goes into every sheet, and what the sequence of sheets is, and so on.

Kazim: Also in Construction, when we were taught how to do the construction of a roof, I wish there had been pictures to explain the different materials that go on top of a roof. I wish we had been taken to a site where an actual roof was being constructed. Also I wish that we had a material exhibition so that could see with our own eyes the different materials that go into construction, for example what water insulation looks like, or heat insulation, or a membrane.

Atiah: Some of the students also do not have the desire and enthusiasm to learn and work. Some of them just want degrees.

Kazim: I would like to add also one more comment. I would like to eliminate all the subjects that we have to read and memorise for examinations, without application in practice. We want the School to teach us practical things, like the office and what goes on there, the construction site and what goes into it, the meaning of sub-contractors, where we get building materials from.

Zinaigeer: The teachers who taught us professional practice don't practise. We want teachers who teach us the know-how of practice. We want teachers with experience.

Group Interview 4

King Fahad University

Interviewees:

Hindi, Firas
Jaroof, Abdul-Majeed
Kayali, Issam
Madkhali, Khalid
Niazi, Abdul-Kareem
Shrbini, Khalid
Zain-Al-Deen, Sami

Researcher: *I would like to ask you about different tasks that are often performed by architects in practice. I would like to know how well you think your School prepared you to perform these tasks. I will start with project management.*

Niazi: We studied only one course, but it was part of another course, so that we studied it too superficially.

Researcher: *Architectural programming?*

Shrbini: We studied this and we were always asked to do a programme before we started a design.

Researcher: *How about site analysis?*

Shrbini: We also do site analysis.

Researcher: *What about cost analysis? How well prepared are you for this?*

Hindi: On the cost of a project and the design to a fixed budget, our preparation was very weak. We have a certain idea of what this is about, but we lack the practical awareness of it that is relevant to the market in Saudi Arabia.

Researcher: *And the production of preliminary architectural drawings?*

Zain-Al-Deen: At the end of each design studio we have to prepare the architectural drawings, such sections, plans, and elevations, and also sometimes models.

Researcher: *To what extent have you been trained to consider in design the social, climatic, and economic aspects?*

Kayali: The social and climatic considerations are always emphasised, but the economic and other practical things – no. There is no emphasis, for example, on structure. We study only theoretical courses, but we do not apply them in the design studio.

Researcher:	***How about working drawings?***
Jaroof:	Not enough. There was only one course and there were no back-up site visits. The subject isn't given due importance. The architectural work is mostly details, and we cannot do architectural details.
Researcher:	***Was there adequate preparation in terms of site and construction supervision?***
Niazi:	No.
Researcher:	***These remarks you have made seem to be particularly critical of the curriculum. Are there any further things you want to add on that topic?***
Hindi:	In Structure we studied only calculation, and we didn't apply it in the design studio. Sometimes we do not know how to choose the right structure. For example, in large spans we use reinforced concrete without awareness that the beam could be one and a half metres deep. If we used another structural system it would be more suitable.
Jaroof:	I think the curriculum would be better if we had more courses in some of the subjects. For example, we studied Construction in one course, but we really need four or five on it.
Madkhali:	Maybe, but I think time is the problem. Jaroof says that we need to spend more time on Construction, for example, but in some cases the amount of information that we study in a course is greater than the time available.
Niazi:	We don't have elective courses through which to further our interests.
Madkhali:	Yes, because there is not enough time and teachers.
Shrbini:	A further point is that the projects offered in the design studio are all similar and repetitive. The only difference is the name of the project. We need new types of project that are linked with the real needs of society. Also the requirement of the final submission is the same for the junior and the senior students. They are all plans, sections, elevations, models, and perspective. As we progress from junior to senior we need more information to be applied, such as architectural details, architectural drawings, cost analysis, etc.
Jaroof:	Some subjects seem of little relevance. For example, the History and Theory of Architecture course is of no benefit. There is no link with the design studio.
Shrbini:	Some of the teachers are busy with their management responsibilities in the School. Sometimes I would like to go and ask them questions after the class, but we find them outside the school in committees, meetings, etc.
Researcher:	***Clearly there is a gap between architectural education and what you meet with in practice. What do you see as the causes of the gap?***
Shrbini:	There are shortcomings in both students and teachers. Teaching methods are theoretical – no co-ordination between the studio and the subjects.

Madkhali: Some important subjects are not given due weight.

Jaroof: That's right. Structure is only three courses. We study them theoretically, but we don't apply what we study in the design studio. We have to select from inside the design studio the right structure and to do the analysis for that.

Kayali: In the jury they ask you about the type of structure you are using. Sometimes we choose the type of structure, but we don't know is it is the right one, suitable for the design. So, again, there is no application of what we study in other subjects in the design studio.

Hindi: The studio is far from the life of practising architects.

Researcher: ***How about the teachers and teaching methods?***

Zain-Al-Deen: The number of teachers is small, so the same teachers have to teach us several design studios.

Hindi: Mind you, the number of students very small too, so there is no competition.

Madkhali: The teachers are prohibited from working in an office so that they can't give us what is new in practice.

Niazi: And teachers are not aware of building laws and safety regulations in Saudi Arabia.

Zain-Al-Deen: In my view some of the teachers are not fit to be teachers from the point of view of conveying knowledge and information. Sometimes the teachers are knowledgeable about the subjects, but they don't know how to transmit the information to us.

Shrbini: On the other hand, some of the teachers don't even know about the subjects they teach. I studied Urban Design with a doctor who had never taught this before, so there was little benefit. The teacher must specialise in the subjects he teaches.

Researcher: ***What about the general physical academic environment, I mean study and training facilities like libraries and labs?***

Madkhali: The library is old, and regular periodicals are few.

Niazi: The workshops and labs are okay. There are excellent workshops and in fact some teachers use them to hold classes in.

Group Interview 5

King Abdul-Aziz University

Interviewees:

Abu-Al-Khair, Hatim
Bugdadi, Waheeb
Gazawi, Riam
Hilmi, A'asim
Johani, Faisal
Kutbi, Iead

Researcher: *I want to find out how well the curriculum that you have gone through prepares you for the different stages that an architectural project goes through? For example, project management?*

Hilmi: We took one course in Project Management, but it was very theoretical.

Researcher: *What about architectural programming, such as the different items of the project and the physical space needed for each one, etc.?*

Gazawi: The stage of architectural programming is the stage we spend most time on, from the study and analysis point of view, and in writing the functional and spatial requirements of projects.

Researcher: *Do you think the practical aspects of architecture are reflected in your design, such as lighting, air-conditioning etc.*

Gazawi: This we study theoretically, but we don't know how it influences design and we don't apply it in the studio. For example, in the design of an office building we leave a space in the ceiling and we call it a duct, and we say to the jury it is for air-conditioning, but its dimension and capacity we don't know. Also we don't know that amount of natural or artificial light that is needed for this project. There are no sources to refer to for this information. Or maybe there are, but we don't know how to refer to them.

Researcher: *How about the choice of structural system for your project?*

Bugdadi: The structure is in one valley, the design in another. In Structure we study only calculation, but not practical solutions.

Johani: As for air-conditioning we studied that, but did not apply it in the design studio. We just know that we have to leave extra room in the ceiling for it. I think that, when we study air-conditioning and lighting, we should take a project and do all the calculations for that project so that we don't forget it.

Researcher: *How about cost analysis? Do you think you can design to a budget?*

Hilmi: We haven't studied it at all. Here in the School we study ideal projects with no link to the real world. We don't take into consideration the calculation of the cost of the building or a budget that we have to design to. We also don't consider that the client has specific need and budget and that we must design accordingly. For example, I have a project, which is the development of a street. In the School it is okay to knock down any building that gets in the way of my design plans. In the real world it is not as simple as this. Now we are working in a way different from the real world. When we graduate we will meet with different clients with different needs and every one of them has his own budget and requirements. These need to be fulfilled.

Kutbi: When I told the teacher that the design I am working on will cost a lot, he replied, 'It's only an exercise.' There is a phrase that we hear from Design One, which is that if everything is going to cost a lot then you won't do anything.

Researcher: Are you comfortable with site analysis?

Abu-Al-Khair: Yes, we do this all the time in every design studio. We analyse the design in terms of the sun movement, the wind, traffic access, relationship to existing buildings, etc.

Researcher: Are you well prepared in the production of architectural drawing, such as elevations, sections, plans?

Kutbi: Yes, we do it all the time.

Abu-Al-Khair: With regard to architectural presentation, it is all personal effort. There is no such taught subject, as there is with photography or model-making. We do it all ourselves.

Researcher: To what extent do your designs reflect the social, climatic, and structural requirements of the project?

Gazawi: The social aspect is greatly emphasised in our projects. The climatic also in the studios. We are always told our designs must fit the harsh climatic conditions of Saudi Arabia.

Researcher: How about working drawing?

Bugdadi: We took only one course on Working Drawing, and in fact it is not enough. I feel that we have some shortcomings in this subject, especially in architectural details and specifications.

Kutbi: In the studio we are always asked to produce floor plans and elevations, not working drawings or architectural details or specifications. For example, we studied water and heat insulation in Building Science, but we were not asked to apply them in the studio.

Johani: We studied Structure, Construction, and Working Drawing courses, but there was no link between the three. There should be a Structure teacher in every design studio to follow up whatever we got from the three courses and make sure that we understand them and apply them in the design studio.

Researcher: Can you deal with bills of quantities?

Johani: This we have not touched on.

Abu-Al-Khair: I am in my final year, and I do not know what bills of quantities means.

Researcher: *Do you feel properly trained in construction and site supervision?*

Johani: We took only one course on Construction Management, but it was focused mainly on the time schedule for completing a project. It did not relate to the actual production on the site and how the building is built, or how problems on the site between the clients, the contractors, and the architect are solved.

Hilmi: In this course we were not taught how to make sure that a building was built on specification. The problem is that some of the subjects are best taught in the class, others should be taught in the workshops or labs, and others should be taught only on the site, such as Construction Management. We should be there to see how materials are handled, how the building is put together, and so on.

Researcher: *Any further comments on the curriculum?*

Gazawi: In this School students of architecture, of landscape, and of planning study three years together the same subjects. Then we branch off, and for three years we study only architectural subjects. In the first three years we study general subjects with sometimes no relevance to architecture. The only thing relevant to architecture that we study is surveying of traditional buildings. And sometimes we study subjects that will not help us in our practice, such as the History and Theory of Architecture. This subject plays a big part in the curriculum, taking up a bigger part than some practical subjects. For example, we studied two courses in the general History of Architecture, two courses in Islamic Architecture, two courses in the History and Theory of architecture. There are repetitive, long, and boring. In the next three years, when we branch off, we go immediately to the design studio without any introduction.

Bugdadi: I would comment that there ought to be a rational sequence of subjects in the curriculum. There are subjects that need to come first, and some that need to be delayed until later. Other subjects need to be taught together in one semester.

Researcher: *Any comments about the design studio?*

Gazawi: In the design studio we feel shattered. Sometimes we have three or four design studio instructors. All of them emphasise the design concept, so that what one instructor sees as correct, the other sees as wrong, one as beautiful, the other as ugly. Sometimes we can't keep up with the changes of our design studio, especially under the pressure of getting low grades.

Kutbi: There ought to be co-ordination between the design studio instructors before they come to class. They should specialise. One should focus only on the design concept, another on structure, other on building science, etc.

Abu-Al-Khair: Sometimes we feel that the subjects that make up the curriculum are fragmented; they are not linked together. We feel really frustrated that these subjects we spend time studying do not contribute to our design studio work.

Researcher: *Any other comments about the design studio?*

Kutbi: There must be a utilisation of the different specialisations of students, with them working together in the design studio.

Researcher: *Now let me come on to your summer training.*

Abu-Al-Khair: There is no supervision from the University in our training. We go to the offices just to get a letter to indicate that we have spent four weeks under their supervision.

Hilmi: I worked for the airport authority and when they discovered that I was a student they only let me work on design, away from the technical affairs.

Researcher: You're indicating a gap between architectural education and practice. What are the causes of this? Do the teachers contribute to it?

Hilmi: Yes most of our teachers don't practice architecture, and are therefore not familiar with the requirements of day-to-day practice. Some can't transmit the knowledge properly. Sometimes we don't understand the subjects.

Researcher: How about teaching methods?

Bugdadi: These are often theoretical only, on the blackboard, with no application of the knowledge in practice.

Johani: Yes, I would agree that the teaching methods are theoretical. Take, for example, medical students. They practice medicine in front of their teachers, and they see how the teacher works and learn from him. As a student of architecture I would like to work with my teacher on a live project.

Abu-Al-Khair: There is also the language factor. Most of the books and references in the library are in English, sixty or seventy percent. Our English language is very weak and we can't read this.

Researcher: How well supplied is your School with workshop, lab, and library facilities?

Gazawi: The labs and workshops are poorly equipped. But the design of the School and the studios are pleasant, a nice working environment.

Hilmi: The library books all old.

Gazawi: With regard to computer labs, they are unequipped. If a student wants learn about Autocad he must do so outside the School. There are some students who will graduate without any knowledge about computers, and as you can see from practice every office uses Autocad now; nothing is drawn manually.

Researcher: Any further comments at the end of this interview?

Abu-Al-Khair: The problem, in my opinion, is that the people in Saudi Arabia do not know what the architectural profession is all about. Everybody knows the function of doctors, lawyers, and teachers. But no one knows about architects, I think because there is no profession association, such as the RIBA or the AIA abroad.

Kutbi: There are also no public lectures to inform the people about architecture. Moreover, the architecture that architects produce in Saudi Arabia does not fulfil people's needs, and so they have lost their trust. The entitlement to be called an architect is not protected – anyone can do it. That's another reason why the public does not respect architects.

Gazawi: The problem of education comes from the problem of practice. There are no particular laws, regulations, etc. specifically for Saudi Arabia. And no books about building materials available in the market, with their details and specifications.

Bugdadi: The student, after graduating, doesn't know where to work or what to do. The School's emphasis is on design only, but in practice the architect does design and other things, such as working drawing, site supervision, etc.

Hilmi: The curriculum simply did not address the problems we might face in real practice in Saudi Arabia. We studied how professional practice and project management are done abroad, so we are not fully prepared for project management in this country.

Johani: The subjects we study are theoretical. For example, the different clients we might meet in practice are taught to us theoretically. Theory, as we are learning, is very different from practice.

APPENDIX III

INTERVIEWS WITH PRACTITIONERS

Interview 1

Aba-Al-Khail, Ibrahim

Researcher: ***Could you give some information about your educational and professional background?***

Aba-Al-Khail: I graduated as an architect from the Beaux Arts in France in 1972, and then I set up my own practice. One branch of my practice is the production of the *Albenaa* architectural periodical, of which I am the publisher and the editor-in-chief.

Researcher: ***Do you think there is a gap between architectural education and practice?***

Aba-Al-Khail: Yes, there is of course a gap. And that is because practitioners and teachers are two different creatures in this country. I spent nine years in the Beaux Arts studying architecture, but when I came back and wanted to teach at the university I found that my degree was equivalent to a B.Arch., and to teach you have to have a Ph.D. Although universities hire staff with the same qualification as me; some of them were my colleagues and we studied together. The only difference is that in their countries the Beaux Art qualification is equivalent to a Ph.D., and here it is not. So the outcome is that, for instance, you might get an Egyptian being hired as a university teacher in Saudi Arabia, because his Beaux Arts degree was enough to get him a foot in the door of university teacher in Egypt, and that in itself meant he had the university status to get a university job in Saudi Arabia. I have set up a practice and have twenty-five years' experience. I would like to do some teaching, even as a part-timer, to pass on some of my knowledge and experience. But the system will not let me do this, because practitioners are not allowed to teach, even part-time.

Researcher: ***How was architectural education done in the Beaux Arts?***

Aba-Al-Khail: Architectural education in the Beaux Arts depended on the capabilities of each student. There were no classes. We studied in what was called the *atelier*. All the instructors were practitioners themselves. The emphasis at the time was on artistic aspects rather than on anthropology. Students at different stages used to study in the same *atelier*, and the more senior students instructed the junior ones. Before you entered the Beaux Arts you had to sit an entrance examination. You had to study for at least one year in an *atelier* to prepare yourself for the examination. I did two, and then sat the exam. It consisted of a piece of design called the *esquisse*, also some other tests on mathematics and a draughtsmanship test using charcoal. The University only admitted the first two hundred that passed. The first year I failed to gain entry to the Beaux Arts, but the second year I was successful. The reason I failed was that my artistic capabilities were not as good as the French. I had of course to change my *atelier*, and then I passed the exam. Just consider the differences in admission procedures between here and there. Here you can be accepted to study architecture on the basis simply of your high school diploma grades; there I had to spend two years, but two valuable years in terms of experience. In the west they take architectural education seriously.

Researcher: ***Could you tell me more about the culture of the ateliers?***

Aba-Al-Khail: In every *atelier* there is a patron, who is a practitioner himself, and he has assistants. Usually the *atelier* is annexed to his practice. The patron comes to see and supervise our work on a daily basis. He usually also gives lectures on the history of architecture and his experience in his practice. Sometimes these are general lectures, open to the general public. As I told you, the *atelier* is not limited to students of any one year. Students at different stages and from different levels work together, so that we used to learn from contact with them. Junior students also used to help senior students with their work. I found it very beneficial. As well as working in the *atelier* we used to go to the Beaux Arts and take courses in construction, structure, building laws, building economics, etc.

Researcher: *After admission, what form did the training take?*

Aba-Al-Khail: After you get admitted to the Beaux Arts you progress through the *classe seconde* to the *classe premiere*. To make this progression successfully you have to finish five *esquisses*, three *projects avants*, and then two *projects longes*. If the student did all the projects offered he could finish the *classe seconde* in two years. The next stage is the *classe premiere*, during which you have to cover several projects and at the end of this stage you do your diploma project.

However, after I finished my *classe seconde* I felt that I needed some practical training, because my grades were getting lower and lower. The reason for this was that the projects were getting bigger and bigger, and I didn't know how to do the working drawings for them. So I looked for an office I could work in. I worked two months for free, and the office paid me for the rest of my time there.

Researcher: *Do you have any contact with schools of architecture in Saudi Arabia?*

Aba-Al-Khail: Yes, through being an assessment jury member for student graduation projects. During the jury meetings I look at the jury work, and I have to say unfortunately that the quality is rubbish.

Researcher: *Why?*

Aba-Al-Khail: There is a design concept, but this design concept is unbuildable, and if it is built, it will not be successful. Some essential needs are not fulfilled, such as the climatic, social, and structural requirements, the building laws and the safety regulations. All of these are not fulfilled. A good design does not mean a beautiful façade alone.

Researcher: *Do you think that there is a gap between architectural education and practice?*

Aba-Al-Khail: There is no professional practice in Saudi Arabia for there to be a gap. The problem lies with architectural practice, for architectural practice is not organised. Every architect refers to a different set of standards, depending on how he was trained. There are no fixed standards, so the school is lost as it does not know what to teach. When the student graduates, he does not know what his functions are. In America or Europe the architect at least has an idea of what he is going to do in an office.

Researcher: *Do you think there are any other reasons for this gap?*

Aba-Al-Khail: General education also contributes to the falling quality of architecture students. There is no teaching of architecture in high school and there are no art classes. Another reason is that architectural curricula in our schools of architecture are not home grown. They were imported from abroad. That is why the education and the practice are not dovetailed in this country.

Interview 2

Ashi, Thamer

Researcher: ***Could you give me some indication of your educational and professional background?***

Ashi: I initially started my architectural education in King Fahad University and then I transferred to King Abdul-Aziz University where I gained my B.Arch. After graduation I worked for one full year with the Abdul-Aziz Kamil Company. Then after that I worked with the Zuhair Fayez Company.

Researcher: ***After two years in practice, how does design differ in the practice from in the school?***

Ashi: In practice every aspect of the design has to be practical. Cost is very important. For example when I worked for Abdul-Aziz Kamil, who designed and built houses for the public, we had to ensure that we designed and built them economically so that he could make a profit.

Another thing is that in practice there is always pressure on time. You have to get the job and finish it in a limited time because there is a client waiting, whereas in the school there is the whole semester to do it. Also in practice you work with more than one project at the same time, whereas in the design studio you have only one project for the whole semester; so you can give all your attention to it alone. Also after I graduated and started to work in practice I found that I was underprepared in architectural details and specifications and knowledge about the available building material in the market. After I finish the design I usually meet with clients and they ask me about details such as whether the materials are available in the market or whether they need to be imported, and how much it is going to cost them. And sometimes I am confronted with technical questions about, perhaps, central air-conditioning, to which I do not know the answers.

Researcher: ***In your opinion, what are the causes of this gap?***

Ashi: In the university, we studied the core programme for three years. We studied general subjects related to planning, landscape, and architecture. However, we were not introduced to design until the first semester of the fourth year. When I first started in the design studio the instructor asked me to start with a concept, like a 'C' shape or an 'L' shape, and try to fit the functions within the shape. However, after graduation and moving into practice I found that there were other constraints on design, such as the orientation of the building, building laws and regulations, and cost, etc. Although we studied all these subjects theoretically, they were not linked to the design studio. The outcome of design studio work in the school depended on how beautiful the building was, and that depended on the taste of the instructor. During the studio work there were no educational objectives which had to be covered before we could move on, such as building design standards. All the design studios I have been through are basically repetitions with different project names. Only the shape and the form of the building was what was emphasised, and what was discussed with the juries. Other technical aspects were not introduced in the design studios, such as building science, architectural details and specification, structure, etc.

Interview 3

Attas, Hashim

Researcher: *Can you tell me something about your professional and educational background?*

Attas: I graduated from King Saud University, and I am working in Makkah municipality now. I am the Director General of Project Design and Supervision.

Researcher: *What are the functions of the architect in the municipality?*

Attas: Jobs like design of municipality projects, site and construction supervision, and management work and administration.

Researcher: *In your experience is there gap between education and practice?*

Attas: Yes, that is my experience.

Researcher: *How does this gap manifest itself in the graduates?*

Attas: In the schools the students are not taught about budget, cost, etc. And I think the imagination of the student in the school is allowed free rein. But in practice there are constraints, such as budgets, regulations, client needs, etc. New graduates lack the awareness of management structures and lines of responsibility, such as the preparation of reports. I sent a graduate to write a report about a building needing repair and he didn't know how to do it.

Graduates also lack understanding of the relationship of architecture to other disciplines, such as civil engineering, electrical and mechanical engineering, etc.

Researcher: *What are the causes of this gap?*

Attas: The architect in the municipality does not work only as a designer but as an administrator, and the schools fail to prepare their students to work in the government, where all architects are involved in administration, such as report writing etc. Further, building laws and the regulations of the municipality are not taught in the schools.

The architectural profession is not organised here in Saudi Arabia so as to help the architect perform his duties and help the schools to teach him.

Interview 4

Bagabas, Ahmed

Researcher: *Could you tell me something about your professional and educational background?*

Bagabas: I graduated from Umm Al-Qura University in 1988, and I have been working here in my father's construction company since then.

Researcher: *What is your function as an architect in this company?*

Bagabas: I don't do design work here, just site and construction supervision and management.

Researcher: *Has the school prepared you for this kind of job?*

Bagabas: No. The school has prepared us only for design, but nothing beyond that.

Researcher: *Do you think, as an architect, that this is enough?*

Bagabas: No, I don't think it is enough, because few graduates work in design after they graduate. From my class only two or three are working now in design. Others are doing other jobs related to architecture, as contractors, construction supervisors, or building material suppliers.

Researcher: *Now that you can look back from practice, what do you think should be added to architectural education that would be helpful to you now?*

Bagabas: Because I am working in the construction business, it would be helpful to have been taught more about construction, naturally. For example, the architects working in the construction business need to speak the language of that business in order to communicate. And likewise they need to be able to communicate effectively with other people like contractors or labour, in order to work professionally with them.

Researcher: *Any other things you could have been better prepared for?*

Bagabas: All the construction process – what goes first, what follows, and so on. It would have been helpful to know more about construction management flow charts. I know that not every graduate needs to know in detail all of these things, but at least every architect should know how a building is constructed. However, the school needs to offer, in addition to the general background, more elective courses in subjects that are of interest to students. For example, ever since I was in the school I knew I was going to work in the construction industry, and I wanted to specialise in this field in terms of taking more courses. But nothing was offered.

Researcher: *Why do you think these courses are neglected in architectural education?*

Bagabas: It's either completely missing from the curriculum, such as the subject of construction supervision, or it is taught theoretically. The Ministry of Housing and Public Works has produced The Handbook for Construction Supervision, which is a very well-written reference about site supervision explaining the various steps that a project goes through during the construction phase, and what needs to be checked. But this book has never been taught in the schools. And all the courses studied were theoretical; we studied subjects without being taught how to apply the theories. For example, the first work carried out on site is the carpentry work, and this often involves right angles. For instance I might find that I am confronted with a corner; in order to verify that the angle is indeed a right angle I make some linear measurements, and measure three metres in one direction and four metres in another. If I stretch a rope between the two points reached and find that it is five metres long I know it is indeed a right angle. In fact this, as it turns out, is the application of the theorem of Pythagoras, where the square on the hypotenuse equals the sum of the squares on the other two sides! But when we were taught Pythagoras's theorem in the School of Architecture, we were never told how and when we were going to apply it. We were only taught how to prove it and how this theorem was discovered. Another example is the working drawing. Architects in practice need to know how to read working drawings. In the School we were taught this again theoretically. We were taught what working drawing was all about, what its use was, etc. But I never saw an actual working drawing until after I graduated.

Interview 5

Fayez, Zuhair

Researcher: ***Can you tell me about your educational background and current position?***

Fayez: I graduated from the University of Colorado, Denver. Currently I am the Chairman of the Zuhair Fayez Partnership Consultants.

Researcher: ***In your opinion do you think that there is a gulf between architectural education and practice in Saudi Arabia?***

Fayez: Yes, I think so. The problem is that the emphasis of architectural education in universities is always in design. I am a member of the advisory board of King Fahad University and the University of Colorado at Denver. In these two universities, for example, most of the courses that are offered in the curriculum are geared toward and around design. So the graduates think that they will work mainly as designers when they graduate. However, in practice conceptualisation and design constitute about eight percent of the work of a project. The rest goes toward documentation, working drawing, structure, architectural details, site supervision, and project administration. Of course sometimes there are more than 25 architects and engineers working in one project simultaneously. So the student, after he graduates, receives a shock because he was prepared for design and not for the other aspects of the work.

For those students who do not have the talent even for design, when they graduate they graduate with nothing to offer at all at first. Some of the students who come and work for me, who don't have natural talent for design, sometimes have the leadership skills for project administration, for example, which has lain hidden because all the time the schools were emphasising design. Other students have again a hidden natural talent for working drawing, architectural details, etc. Some of the architects have the talent for architectural presentation rather than design, and this is all that they do in my firm. Indeed there is a gap between architectural education and practice, and I think the school should address the other aspects of architectural practice.

Researcher: ***What is the role of the architect in your firm?***

Fayez: Here in our firm there is the co-ordinator of architectural drawings, and he makes sure that all the drawings for the project fit each other. He also co-ordinates between architecture and other specialisations, like structural and electrical engineering. There is also the project architect, whom we call the 'job captain'. Under his supervision work several architects who initially made the conceptualisation and design of the project. After the project goes to the second phase of producing working drawings, the job captain makes sure that the design concept remains the same. Because in the working drawing stage of the product some structural details - the sizes of the columns, of the beams, etc. - sometimes affect the integrity of the design. The job captain's task is to ensure that the technical details don't affect the design.

There is also another type of architect in the firm, the business architect. His job is to convince clients, to communicate with clients, to bring new jobs to the firm, and to try to sell the design.

There are five qualities of architect, which are important in practice. The first one is the architect as a teacher. This is a required quality because a senior architect has to teach a junior the experience of practice. Second, there is the architect as a student. In this case, the architect should have a talent for learning, so that he can learn the knowledge and the skill from a senior architect. Third, you have the architect as an artist, with artistic talent and imagination to do the design concepts. The architect as a professional, so that he can do the documentation of the project, such as working drawing, architectural details, and specification. Lastly the architect as a businessman, where he can communicate with clients, administer his office, and so on. Also one of the functions of the architect nowadays is construction supervision. Because even if the documentation is complete something will come up while the project is underway which will need the immediate attention of the architect. The architect also needs to be on the site to ensure that the constructor is following the exact specifications of the documentation.

Researcher: ***In this occasion, do you have any thing you would like to say about architectural students in Saudi Arabia?***

Fayez: The student is somewhat prepared in the design aspects, but he does not have a full understanding of the comprehensiveness of architectural work. After the student graduates and comes to work in my office he thinks that architectural world is the product of a good concept in design, but he does not know what goes on after the design concept stage. The student's design concepts lack the practicalities of architectural work. This is what I notice from the students who come for their summer training in my office. (I take about twenty to thirty students a year.)

The students nowadays lack the desire to learn when they come to their summer training. They lack the fighting spirit; they come to the office and spend the time there as a chore, something they have to do. When they come for their summer training I find that they don't take it seriously.

Researcher: ***Speaking of summer training, how would you judge the worth of it as it is conducted here in Saudi Arabia?***

Fayez: Practical training is a crucial and important stage in the overall preparation of an architect. I have studied architecture at the University of Colorado at Denver. After that, I worked for three years in an architectural firm in Denver. This period of training gave me exceptional practical advantage over other graduates. By contrast, the period of practical training required by schools of architecture in Saudi Arabia is merely four to eight weeks. This duration is too short for a student to get any thing from his office training. The summer training should be at least a year and it should be organised and supervised by the school. I can not over emphasise the importance of practical training. The practice teaches the students the culture of the office. When he comes to the office the student begins to apply and understand knowledge and skills that he has learned only in theory and memorised in the schools. Architectural training in the past used to be undertaken in the office. Now architectural education is completely separated from the office. Medical education was faced with the same problem, but they solved this problem through the teaching hospital. The medical student studies in the school and practises in the hospital at the same time, so that there is no separation between the theoretical knowledge and its application. I think that all schools of architecture should have their own teaching offices attached to them. Or, maybe the schools should organise with the local offices to train their students. One way or another I think the student should work and practise while they are studying; they should immediately apply the knowledge they gain in the school.

Researcher: ***How do you see the co-operation between the schools and the practising offices?***

Fayez: Unfortunately there isn't enough dialogue between the schools and the offices although it is beneficial for the profession as a whole. And as I told you there must be a system through which the student can interact with practice.

Researcher: *What sort of specifications and architectural details do you use for your projects?*

Fayez: For our working drawings, architectural details, and specifications we use the American code and standards. Since there is no Saudi code or standards, this was our choice. You have to follow some system, so we followed the American one. As for the architectural details, it depends on what is available in the market. The goal of our office is to become an international architectural firm. When I started my professional practice during the seventies, it was in a very bad state in Saudi Arabia. Working drawing was only seven sheets, not containing any information. The quality of design was also low. Some of my colleagues who graduated from America told me: 'Don't bother yourself. The people will not pay you for your work. And the contractors do not know how to execute the projects.' The contractors didn't know how to do some of the work, such as heat insulation or water insulation. If you looked at drawings, you would have seen that every sheet was on a different scale, and there was no consistent system for working drawings or specification or anything like that at the time.

Therefore, I had to bring four of my American colleagues to help me run my newly established office. We worked from scratch. First of all, we set up a system for architectural drawings and we introduced the American code and standards. The first project I ever did was a house, a villa type for Hisham Nazer, who was the Minister of Planning. At the time even the doors and windows were imported from Lebanon because they were available on the market with the specification he required. New materials have arrived on the market. We get them through salesmen and catalogues.

Researcher: *From you experience of newly graduated students could you tell me what their shortcomings are in respect to practice?*

Fayez: The graduates are deficient in working drawing. Not only do they not know how to do it, but what the concept of the working drawing is all about, what to put into it and the hierarchy of the working drawing from the site plan to the details. So we have to re-educate the graduate in this matter of working drawing through what is called a storybook. Through this we have to teach them what each sheet is about, the number of the sheets required, what goes on each sheet, and what is its arrangement. We use one of our previous projects with live examples to show it should be done.

Researcher: *Could you tell me more about what the new graduates lack when they come and work in your office?*

Fayez: The students lack due understanding of human behaviour and its influence on design, the understanding of the client's needs. Also they lack understanding of building economics. These things unfortunately are not addressed in the school. Because the teachers themselves are not involved in practice, they are not exposed to these practice concerns. Either implicitly or explicitly, the student is taught that the design of a good form and a nice elevation is what architecture is all about. Although this might be true in practice, they are not the only criteria. The other criteria that should be taught to the student is to design to budget, deliver it on time, and build it without errors, delays, and mistakes. The most important things for clients are firstly the budget, then time, and then mistakes. These things are not, and cannot be, taught in the schools. These things should be taught in the office. The students are taught phrases in the schools, and they know that they are important, but they don't know what they mean in practice and what the implications of these things are on design.

Researcher: *Would you like to say anything more about the graduates?*

Fayez: Yes. There is one thing I would like to add. In schools of architecture, there is an emphasis on individuality rather than on teamwork. Nowadays in practice, a team of architects and engineers produces the project, and not an individual person.

Researcher: ***Why is it like that?***

Fayez: This is because the map of professional practice has changed. Now you have specialisation, competition, cost control, etc. The days of the master builder are over; now there is the master firm. So you can find in my firm here an architect who specialises only in working drawing, another who specialises in architectural details and specification, etc. Now you want to produce documentation that could be priced and built without getting into problems during the construction stage.

Let me tell you this, in Saudi Arabia the production of a project is much more demanding than in other parts of the world. In other parts of the world you can build a project with only 25 percent of the documentation needed for a project. This is because abroad there are certain architectural details and specifications that are a standard part of architectural practice, so that you do not have to spell them out anew each time. Here specification and architectural details are not standardised, and you have people using specifications from all over the world, America, Britain, Germany, France, and so on. That is why you have to specify every item in the project and draw the relevant details for it each time. This is how you can control the building contractor. You refer to this documentation in the case of any conflict, for example between the client and the building contractor.

Researcher: ***What do you think should be added to the school curriculum to remedy these shortcomings?***

Fayez: As I told you, I am on the advisory board of the University of Colorado at Denver. On my last visit to them I found out that they had added subjects that they did not teach before, and they are mainly to do with architectural details and professional practice. Architectural schools in Saudi Arabia should gain some insights as how to develop their curriculum from such experiences.

Researcher: ***What is your opinion on architectural practice in Saudi Arabia?***

Fayez: Frankly architectural practice in Saudi Arabia is not organised, and there is no quality control because there are no professional institutions. Here in Saudi Arabia you can design a building with seven sheets of working drawing and you can get a building permit. But in my office we present hundreds of drawings. The reason for that is the emphasis on quality in my office. To provide quality you have to provide detailed and extensive numbers of drawings. Other architectural practices may be prepared to do just a few drawings and seek business in that way. One result of this is that I charge clients according to the work that I do. For a house I may charge a client SR 100,000 where another architecture firm may charge just SR 5,000, so that clients may ask why we charge so much. I have to explain to them what is involved in quality work and service. If there were quality control, other architecture businesses would have to prepare more and better drawings, and would have to charge more. That is why architecture is a very hard business in Saudi Arabia.

My firm is involved in management information systems as well as architecture, and I can tell you that two thirds of my income actually comes from that rather than architecture. Architecture means prestige and reputation, but management information systems mean income. Sometimes architectural practice in this country does not put bread on the table.

Interview 6

Kamel, Abdul-Aziz

Researcher: *Could you tell me something about you professional background and current position?*

Kamel: I graduated from Riyadh university in 1975. After I graduated I did not practise architecture for fifteen years. I worked in Dallah Corporation as a construction supervisor, during which time I travelled extensively to different parts of the world. Now I am the Director General of the Urban Development Establishment.

Researcher: *From you experience of newly graduated students could you tell me how they perform in respect to practice?*

Kamel: Most of the graduates who work here in my office have graduated from the University of Jeddah. New graduates are not knowledgeable about the vocabulary of traditional Islamic architecture. For example, you find a new graduate uses the *roshan* [mashrabia] as an aesthetic element. They utilise it in the facade, and then they put a modern window behind it. They don't know the underlying climatic and social functions behind it. Also the students don't have a grasp of building economics. They don't realise the economic dimension of line they draw on the sheet. Again, from my experience with students I find them underprepared in terms of architectural details.

Researcher: *What do you think the new graduate needs for a successful entry into practice?*

Kamel: The architect needs an architectural talent, a grasp of professional practice, and knowledge about sociology and economics.

Researcher: *Why do you think that the students exhibit these shortcomings?*

Kamel: The reason for this is that the practices the students are taught in the schools in our universities are all imported from abroad, and they are not harmonious with our environment. Also, the identity of our contemporary architecture is in a state of uncertainty, which doesn't help the situation at all. Now we teach architecture by means of imported curricula from the west. When the students specify materials for a project, they specify materials in such a way that have to be imported from the abroad, because that is all they are familiar with. They cannot specify materials that are available locally, and can be made by local craftsmen. In the Islamic world nowadays there are 30 million craftsmen, and they are not fully utilised.

Researcher: *Thank you very much for giving me this opportunity. At the end of this interview would you like to add any comment?*

Kamel: Yes, indeed and it is about the quality of the practising architects in the market. The quality graduates who graduate with distinction and bound to be good architects are usually employed as teaching assistants in the universities, go and get their Ph.D.s, and become teachers. So the practice of architecture is deprived of these naturally talented people. I wish that you could address this issue in your research.

Interview 7

Kamfer, Waheeb

Researcher: *Could you tell me something about your educational and professional background?*

Kamfer: I graduated from Umm Al-Qura University in 1987. Then I worked in the municipality of Makkah for three years. After that I established my own practice.

Researcher: *Do you think there is a gap between architectural education and practice?*

Kamfer: A hundred percent true statement.

Researcher: *How so?*

Kamfer: The practice life demands from practitioners that they should be architectural engineers. Design talent and creativity is but a part of professional activity. There are other talents which are needed to support this design ability: for example, the background of how the building is constructed on the site, and the priorities in this process; management, which is the single factor that determines the success or failure of any architectural project; an understanding of other engineering specialities such as structural, electrical, and mechanical engineering and how they contribute to the architectural work; an understanding of building laws, safety regulations, civil defence, and the regulations of the Ministry of Health; and understanding of how the building should be maintained after it is built. These are just examples of the other talents that a graduate needs for a successful entry into practice, but unfortunately the schools prepare the students for the task of design only.

Researcher: *Why do you think there is this gap?*

Kamfer: One of the reasons that led to this gap is that the doctors do not practise architecture as a profession. And that the curriculum was devised by academic teachers without consulting those who practise architecture. In addition to this all of the design-supporting subjects are taught theoretically without application in the design studio. For example, structure is taught from a civil engineering point of view. The Structure teacher used to teach us calculations – how to calculate spans, columns, foundations, etc. But these are not what the architect needs in practice. The architect does not do the structural analysis of a building. He needs to know the approximate sizes of the structural elements, and he needs to know the structural vocabulary through which he can interact with the structural engineer. Most importantly, the architect needs to know the potentialities of structural systems so that he can ensure his design concept is buildable, and what structural systems are most suited to his designs in terms of economy, construction, etc.

Further, take the subject of electrical fixtures. What we studied was irrelevant to practice. We studied, for example, amps and ohms like electrical engineers do. In practice what I need to know is how I can distribute my lighting fixtures in a space, how the artificial light will interact with the natural light, what number of lights I need in a room, etc. This all differs from one building to another. The amount of light you need in a school for instance is not the same as you need in your home.

Also, on the subject of mechanical fixtures, architects in practice need to know the amount of air-conditioning required to make the room comfortable, and how the openings and ducts would affect other design features, such as the height of the ceilings.

In building economics the student needs to know about feasibility studies, cost analysis, etc. He needs to know approximately how much a building will cost. He needs to know how to make a building less expensive. He doesn't need to do all of these, of course, but he needs to know about them. And unfortunately in the school he is not exposed to these issues.

In Materials, we studied materials that are not used in Saudi Arabia, for example wood (on which we spent a whole semester). In the Materials course we needed to study what materials were actually available on the market, what their costs and potentialities were, and so on. And we were taught this subject by teachers from the Civil Engineering Department, so they weren't aware of what information architects needed to know. In fact these teachers were often from overseas and were not exposed to the Saudi market.

Researcher: ***Do you have any comments at the end of this interview?***

Kamfer: Yes I'd like to add two comments. The first is that there needs to be a variety of projects offered in the design studio. What is offered now in the design studio is one type of project, which is the monumental or stylistic building. In practice, however, architects rarely get this kind of project to do, especially at the beginning of their careers. They need to introduce more practical subjects, such as housing units for limited income people, or multi-purpose apartment complexes in expensive areas where the income generated is very important, or design in historical areas.

Another comment is about visual communications skills. The architect needs to know how to translate his concepts and describe them in architectural drawings and how to defend them. So he needs skills in architectural drawing and in verbal communication.

Interview 8

Kurdi, Nizar

Researcher: *Could you tell me something about your educational and professional background?*

Kurdi: I graduated from King Saud University from the School of Architecture four years ago, and I have been working ever since in the Design Department of the Ministry of Housing and Public Works.

Researcher: *What is the architect's role in this Department?*

Kurdi: Here in the department the project goes through three stages. The first is the preliminary studies, where we collect data about the projects, meet with clients, and write down their requirements. The second phase is when we do the actual design of the project, and at this stage there must be a co-ordination between the different specialities, the architects on the one hand, and the structural, electrical, mechanical engineers, and landscape architects on the other. At the end of this stage we do all the architectural drawing and make a model, if required. After that we meet with the client and listen to his comments about the design. If there is a comment then we try to satisfy his needs and adjust the design a little bit. If not, upon the approval of the client, the project goes to the third stage. At this stage we do all the necessary working drawing, architectural details, bills of quantities, specification, and cost analysis.

Researcher: *What exactly do you do as an architect in the working drawing?*

Kurdi: We do the working drawings for architectural works. For example we do architectural details for water, heat, and sound insulation. We also do the architectural details for various elements such as doors, windows, tiles, etc.

Researcher: *How about the air-conditioning, the structural work, and electrical work?*

Kurdi: No. other engineers do the working drawings for these aspects of the work. But although they produce the work they have to consult us about decisions relating to the architecture of the building. For example, the structural elements such as columns should not interfere with the interior spaces of the building. Also, as an architect I tell the electrical engineer where the switches and plugs should go, and the vents for the air conditioning, and the engineer does the calculations and drawings.

Researcher: *Do you think, having worked now for five years, that there is a gap between architectural education and practice?*

Kurdi: I think there is a serious gap, because the schools do not prepare their students to work in practice, as a practitioner.

Researcher: *How do you think it is this way?*

Kurdi: In the university the projects we do are unrealistic. Therefore they are irrational. We don't take into our consideration the requirements of the owner or the cost of the building. All that is emphasised in the design studio is the creativity of the student. I think there should be more emphasis on the use of different building materials and techniques, and there should be an emphasis on the general cost of the building. For example, when I graduated I didn't know about the building materials available in the market even the architectural materials, such as the different tiles I can use in the design and how much they cost.

Researcher: *Why do you think there is this gap?*

Kurdi: Most of the teachers in the schools of architecture are academics with only an academic background; they lack practical experience. As an example I can cite the case of the Management Institute. The Institution, as part of the government staff development scheme, holds evening classes, which used to be taught by senior employees. Now these classes are taught by Ph.D. graduates who have no practical experience to transmit to those they are teaching. So the quality of teaching has diminished.

Researcher: *How about the curriculum? Do you have anything to say about the curriculum?*

Kurdi: Yes. The problem with the curriculum is that it is not updated regularly. The teachers teach the subject without any updating for six years or even more. And when the curriculum is due for updating, those in charge of that should consult with practising architects to find out from them what is relevant for the curriculum. Also the curriculum lacks essential elements from practice, such as site supervision. When we studied architecture the teachers never took us to make site visits to experience the reality behind building construction. There are also no permanent exhibitions where photographs of international buildings are exhibited for us to see.

Researcher: *Do you think now, looking back, that there was co-operation between your training and architectural practice?*

Kurdi: No. I think one of the problems is that there was no such co-operation between the school and practice. One of the problems is that the practitioners themselves, who have the practical experience, do not teach in our schools. Their practical experience would be of great benefit to the student. I think that there ought to be some form of co-operation between the school and practice. For example the student ought to take a year practical training in an office under the supervision of the school before graduation.

Researcher: *Do you have any comments you would like to add at the end of this interview?*

Kurdi: Yes. In the design studio we used to design projects without any realistic constraints, such as building law, regulations, etc. The graduation project, I think, should be a multidisciplinary project between architects and structural, electrical, and mechanical engineers, and so on. In the universities, there is an emphasis on the work of the individual, but in reality the work is produced by a team. So after he graduates the student finds it hard to work in a team. Another point I would like to add is that the civil service does not reflect the need of architectural practice in the government. For instance there are no architect job descriptions so that the schools would know what is expected of them in the way of training architects.

Interview 9

Masoud, Arif

Researcher: ***How is the business of architectural practice, to which the student must adapt himself, conducted in your office?***

Masoud: In architecture there are fifty different fields within which the architect can produce. And take one of them, concept design. Within concept design itself there are different fields. It could be the development of a sketch or the designing of a sketch itself. Part of the concept is how you illustrate the idea, whether by three-dimensional sketches, by talking about it, or by slides. After that the architect has to consider how to relate to the floor plans, the elevation, and the sections, and start to put a creative image to it. Is there, for example, a special detail to the sketch? How can you solve it? The architect should think in three dimensions, seeing the building in three dimensions. Most of the students who come to us think in two dimensions. We need a student who can learn.

After the concept design the project branches into two fields, those of the project manager and of the project architect. Once you do the design and the design is approved by the client the project goes into what is called the project production stage, which is the process of doing working drawings, specification, and quantity surveying. Some of the architects who are good in details and working drawings become project architects. Under them will be a big staff, and they are responsible for doing all the construction documents.

Above them and senior to them is the project manager, who has the management capabilities to manage the project, like doing correspondence, and talking to clients. Dealing with a client is a very big and important aspect.

I am the head of the Design Department, where we have both senior and junior architects dealing with architecture graphics. We take care of competition, model making, and the schematic work. Once we get the job done then the project goes to the Technical Department, which deals with structure and engineering.

Researcher: ***In the light of your experience of new graduates, do you think there is a gap between architectural education and practice?***

Masoud: There is a very big gap between the person who is freshly qualified and the person who does professional architecture.

One of the major shortcomings is the understanding of time versus production. In college life time is measured, but at a certain pace, which is very different from the professional pace. When a student comes to an architectural office every hour is measured because someone is paying for it. And because he is paying for it he starts measuring and evaluating time versus production. That is where the biggest gap occurs.

The second gap is the quality, the overall capabilities of the student himself. Is has to do with what the architect is given and how the architect will execute these tasks, producing professional work whether he is giving a presentation, talking to a client, or designing something.

So, the first problem, again, is how to be productive within a certain period of time as efficiently as possible, and the second is the overall quality of the architect. The graduate has to learn the concept of coming and going at a particular time, and of giving a time value to the money the employer is paying.

Of great importance for new graduates, and an area in which the gap between training and practice manifests itself, are the non-technical aspects of architectural practice. I mean how to deal with people – any and all kinds of people. They have to learn how to meet with clients, and how to relate within the office itself, how to work with team members. Very few graduates know how to work as a team member, how to respect senior architects, or how to make a junior architect work and tackle his problems. Some of the students are good architects but they don't know how to work with other architects.

Of course, in addition the actual technical professional skills of how to design, how to express your ideas using pencils or computers, is very important. A new graduate must retain his sense of being involved in training and learning. If you are not ready to listen and accept criticism then you are not ready to learn.

Interview 10

Nwaeser, Ibrahim

Researcher: *Could you give me some information about your educational and professional background?*

Nwaeser: Of course. I graduated from the School of Architecture in King Saud University in 1988. I have been working in the Ministry of Housing and Public Works ever since.

Researcher: *Could you tell me about the nature of your work in the Ministry?*

Nwaeser: I mostly design residential units for our housing projects. I also supervise the handing over of these units from the contractor to the Ministry.

Researcher: *Do you do any architectural programming for these housing units?*

Nwaeser: No. The programme is handed to us from the Department of Design.

Researcher: *How about working drawing and cost analysis?*

Nwaeser: No, these are not part of my work.

Researcher: *How about site supervision, for example?*

Nwaeser: No, this is not part of my job; as I told you, I do only the design.

Researcher: *What is your role in the handing over procedure?*

Nwaeser: It is that, at the final phase of building construction, you have to make sure that it has been built according to the specifications and details of the working drawing. You have to make sure that the contractor, for instance, has used the right tiles and the right technique to lay them. Also you have to make sure that the correct water and heat insulation system was used, etc. So my role is just to look at the architectural side of construction at the handover. Other members of the hand over committee, such as electrical engineers, take care of the electrical side of construction, and so on.

Researcher: *Does your work involve any other tasks?*

Nwaeser: Yes. By the nature of my job I do some administrative work, such as writing reports if there is a problem with the buildings I inspect.

Researcher: *Do you think that there is some sort of a gap between education and practice?*

Nwaeser: Yes. Not all the things we do in practice are handled in the curriculum, for instance the procedures involved in the handing over of buildings. For example, when I was asked, after I had been about three or four months in the post, to inspect a building and sign for the handing over of the building from the builder, I had to tell my boss that I did not know how to carry out such an inspection, which was a surprise to him, as he had assumed I had been taught how to do this in my architectural training. Our study in the school was purely theoretical. We knew about the subjects, but did not know how to apply them in the design studio. Our only motivation to study these subjects was to get high grades.

Researcher: *Could you say what in your opinion the causes of this gap are? The teacher, for example?*

Nwaeser: What about the teacher?

Researcher: *Well, other interviewees have pointed out that teachers lack practical experience because they don't practice architecture.*

Nwaeser: This is true. I remember that when I was a student I studied in the design studio with a professor who used to be the Director of the Administration of Building Construction in the Ministry of Interior. And we were really happy and comfortable working under his supervision because his practical experience was reflected in his teaching. We felt as though we were working in a real office.

Researcher: *How about the library?*

Nwaeser: At the time we did not have a library in our school, and we had to use the University Central Library, which was not accessible because it was far away.

Researcher: *How about the labs and workshops?*

Nwaeser: These were not available in the school when I was a student.

Researcher: *Could you tell me about your experience of summer training?*

Nwaeser: Sixty days only. It wasn't of a great benefit to me because the architects were so many that I was lost between them.

Researcher: *Do you have anything to say about the curriculum?*

Nwaeser: The emphasis in our studies was on function and beauty, nothing else. For example in Building Science we were taught that the people's favourite wind is the north wind. However, when we graduated we found that their favourite wind comes from the south or the south-east, and the wind that comes from the north is the cold wind, especially in winter. So if you have a balcony and it is facing north, this is not what the family wants. These things we were not aware of at university. Also the History of Architecture was irrelevant. The emphasis was on studies of ancient temples and Egyptian pyramids, and to me it was just a waste of time.

Interview 11

Qurashi, Abdullah

Researcher: *Could you give me some information about your educational and professional background?*

Qurashi: I gained my B.Arch. in the USA. I work now as a Project Manager in the Technical Department of Zuhair Fayez Partnership Consultants.

Researcher: *What is the nature of your work in this department?*

Qurashi: As I said, I am a Project Manager. The Technical Department is divided into different engineering sections, who produce the working drawing for a project. This section where we are now is the Project Manager's section. Each Project Manager is responsible for a project. Our function is communication between the office and the client, and we follow the different stages the project goes through. We make sure that the design concept and the client requirements are fulfilled.

Researcher: *Do you think there is a gap between architectural education and practice in Saudi Arabia?*

Qurashi: Before we speak about the gap between architectural education and practice we have to speak about a basic missing element, which has both cultural and social depth. This element is work ethics. My understanding of work ethics is that a student may have respect for a certain profession and may set his sights on joining it. To this end he studies hard, qualifies, and then works hard at his chosen profession. However, this view of work ethics is not available to the Saudi student today, or at least it is only available in a distorted form.

There is a tendency to concentrate on quantity not quality, and a student thinks that if he succeeds in this he will make millions. Or else perhaps he dreams of hitting it lucky as a prestige designer, and this too will make him millions. But in reality it is not like that. In reality, the true work ethic is that of the professional who works hard and honestly to satisfy his clients and do a good professional job. The thing is, there is no effective professional association in Saudi Arabia which can take the lead in this.

So as an answer to your question, yes I think that there is a gap. The concept and philosophy of quality architecture is missing in Saudi universities. And at the level of technology what is produced is rubbish.

Researcher: *In your opinion what do you think should be done to reduce the gap between education and practice exists?*

Qurashi: The library should be provided with books and architectural magazines to help to widen the horizon of the student and give him the widest possible way to gain knowledge. Further, to support my claim that the schools emphasise design, all the architectural periodicals are concerned with styles and not technical aspects. There is also a common practice in the USA and Europe that the student takes two years' practical experience before becoming an architect. If this were done here it would have very beneficial consequences.

Researcher: *How do you see the graduates who work in your department?*

Qurashi: We suffer from the work ethics of all the Saudis who work for us. They lack the commitment to work. They work in a slapdash way, to get things out of the way as soon as possible. Also all of the graduates lack the technical understanding of architecture. I think the schools here teach them something about specifications, but all their studies are theoretical; they don't know how to apply their knowledge in practice. Go and ask any graduate to write a primary four-page specifications for a house, and I bet you he can't do it. He can't specify the doors, the windows, etc. After he starts work he has to go through a learning process in order to know how to do that. This doesn't surprise me, because most, if not all, of the Saudi universities do not have Suite Catalogues for the student to learn about architectural details and specification.

Researcher: *Speaking about architectural details and specification, what standard do you use in your office?*

Qurashi: As you know there are no Saudi standards, so we use the American ones. For fire and safety we use the National Fire Protection Agency. For graphic standards we use Time Savers and the American Graphic Standard. With regard to architectural details, we ask the manufacturers to send us details of the items we request. We also have built our own database for architectural details, especially for those details which are often in demand, such as the fixing of a window over a block or a block over a block, and how a window is fitted into position. And these books on standards are so many that it is not fair to ask the student to know all of them. But he at least should know how to find references and he should know how to draw the most common details.

Interview 12

Rifai, Mohammed Maher

Researcher: *Could you give me some information about your educational and professional background?*

Rifai: I gained my B.Arch. from King Saud University in 1984. I also gained my Master's degree in Project Management from the same university. Currently I am the Assistant Director of the Consultants Group.

Researcher: *What is the function of your company?*

Rifai: We do designs for housing, governmental, and commercial buildings. We also do construction and site supervision on behalf of clients.

Researcher: *As an architect, what is your role in the company?*

Rifai: Now, being the Assistant Director, I meet with clients and write down their requirements, and pass on these requirements to the design department. When we first started I used to do everything myself. I used to meet with clients, do the design, do the architectural working drawing, etc. Now I just meet with clients and do general management in the office.

Researcher: *It is said that there is a gap between architectural education and practice. What is your opinion about that?*

Rifai: Yes, I think it's true. And I think the reason for this gap is that most of the teaching staff do not practise architecture. They emphasise only theoretical and philosophical aspects of design, and when their students graduate they find themselves speaking a different language from those with whom they have to deal professionally.

Researcher: *You mentioned that most of your work now is office and project management. Do you think that the school has prepared you for this task?*

Rifai: No, I don't think so. When I was in the school there were not enough courses on this subject. In fact there was only one course as I remember, and it was theoretical. It was not linked to practice in Saudi Arabia. It was a course on professional practice and construction management as it is practised abroad, but not as it is practised in Saudi Arabia. What helped me, however, is that I used to work while a student, and that was useful after I graduated.

Researcher: *What is the role of the architect in your office in the production of project documents?*

Rifai: Everything that is related to architecture. Studies, cost analysis, etc. I supervise architects and engineers from several domains, and everybody works in his domain.

Researcher:	*Could you be more specific about what the architect does in the process of project documentation?*
Rifai:	Of course: After the end of the design phase the project goes to the documentation phase. Architects do the following: they quantity survey all the architectural elements in a building, such as doors, windows, paint, etc. Then they draw all the architectural details for it, and specify each item and how much it is going to cost. And that of course includes every single architectural item in the building. After they quantity survey everything they lay it out in the form of bills of quantities and tables, which include the costs and the specifications. The cost, I forgot to tell you, consists of the cost of the material itself, the cost of the labour, and our profit. Of course all these bills of quantity are accompanied by the necessary architectural details and working drawings. This is basically the role of the architect in practice, in addition of course to his role in the design phase.
Researcher:	*Does the architect in your company do any construction or site supervision?*
Rifai:	Yes, of course. It is part of his work after we write the contract with the clients and the project goes to the construction phase that the architect supervises the architectural works and ensures that the building is being built according to the specifications.
Researcher:	*Do you think that the school prepares the students for these tasks?*
Rifai:	No, I don't think that the school prepares the student for this role. They prepare the student to work on the design phase of a project, but not on the supervision or the construction phase. But a good student will pick these things up in about two years in practice.
Researcher:	*What do you think the student needs?*
Rifai:	As I told you, generally the students are good at working on the design phase after they graduate. However, they need to be better informed on building economics, feasibility studies, working drawing, and architectural details and specification. When I was student at the School there were three courses covering these subjects, but now this has been compressed to one course covering them all. Also I would like to mention one more thing here. It is not only in the documentation and construction phases that the new graduate is weak. Even in the design phase, he has some shortcomings that could be mentioned. Any architect or engineer can sit down and sketch different spaces for a given design, but a good design involves more things than that. To start designing you need a good concept and a sound philosophy to start with. Also a good design should respect the social and environmental context. Then the design needs to be economical. I am not saying that the student should be fully fledged when he graduates and able to do all of these things, but he should at least be aware of them. When the student comes for summer training and you give him something to design he does just any design; the form he makes does not have a concept behind it. The students do designs that are not responsive to the harsh climate that we have here. They use large windows made of glass, for example, which are not suitable for our climate.
Researcher:	*Now I would like to ask you about some specific course groups. Do you have any comments about the history and theory courses, for example?*

Rifai: The subjects of history and theory were of no benefit to me personally, and they have nothing to do with practice. We did not study these subjects in terms of the relation of man to his environment, or of the philosophy of architecture, but in terms of what the Greeks did, what the Romans did, how certain churches were built, and so on.

Researcher: *How about building science subjects?*

Rifai: You mean topics like climate issues, sound and light, structure, and so on?

Researcher: *Yes.*

Rifai: We studied all of these in the form of separate courses, but they were all theoretical; they were not linked to the design studio.

Researcher: *Do you have any comments you would like to add about the curriculum?*

Rifai: The curriculum as it is, is okay, but the different subjects need to be tied together. The subjects today are in something of a mess. The teachers do not know what to teach the students, because practice is not consistent, and there are to some extent no fixed standards there. The result is that each teacher tends to teach a subject according to his own training background. So teachers who have graduated in America teach the American details and specification, teachers who have graduated in the UK teach the British way of doing working drawing, and so on. Also, at the time when we were students there were courses on architectural presentation, model making, and photography. Now these courses have been eliminated, which has left a negative influence on the student's ability in architectural presentation.

Researcher: *Now that we have established that there is a gap between architectural and practice, could you tell me the causes of this gap?*

Rifai: The first thing is that the teachers lack practical experience. Also, some of the teachers use the lecture as the only means of teaching. Not all the teachers are like that. Some of them take their students to visit construction sites and factories, where they can see the architectural details and how buildings are being built in person.

Researcher: *How about the physical academic environment, such as the library, labs, etc.?*

Rifai: The School has an excellent library and good labs, but they are under-utilised.

Researcher: *How about the summer training?*

Rifai: Unfortunately it is not taken seriously because it is unorganised and too short.

Interview 13

Sedairi, Badr

Researcher: *Can you tell me something about your educational and professional background?*

Sedairi: I graduated from the School of Architecture of King Saud University. Then I worked in the Ministry of Housing and Public Works. Several years after that I gained my Master's degree from the University of Arizona. Now I am the Director General of Design in the Ministry's Department of Architecture.

Researcher: *Could you tell me about the role of the architect in the Ministry?*

Sedairi: First of all our role is assisting other ministries in their building requirements, such as the Ministry of Education, the Ministry of Health, the Ministry of Interior, and especially those ministries which do not have an internal architecture department. So the Ministry of Public Works is like a comprehensive practising office. We do architectural programming, design, construction and site supervision, and quality control. If a given ministry wants to build a building they contact us, and we do the programming for them, and the design. We then hand it over to the contractor to build it, but we continue to supervise the construction. Sometime some ministries elect to hire a private practice to do the design, and they contact us to do the site supervision for them.

Researcher: *Do you do all of these tasks here in your Architecture Department?*

Sedairi: No. In our Department we do only the design and the necessary working drawing. But there are other departments for several other jobs. We have the Department of Building Construction, where they hand in our documents to the contractor and then the Departments themselves supervise the construction and the quality control. There is also the Central Office for Building and Construction. They produce all the information we need, like the specifications, the building codes and standards, and bills of quantities, but do not commission or carry out any actual work themselves. All of this information is available in data form for us to consult.

Researcher: *Is this like a Saudi code of building standards and specifications?*

Sedairi: No. It is just series of standards and specifications for our Ministry. No other agency is compelled to follow it. Though, anybody is welcome to use it.

Researcher: *What is the role of the architect in your Department?*

Sedairi: As I told you we do everything here, from meeting with the client and writing down his requirements all the way to handing in the documents to the contractor. There isn't any one architect who does all of these. There are some who work on the architectural programming, and some on the design itself. Others work on working drawings and some of the architects specialise only in architectural details. Other architects work on bills of quantities, specifications, etc.

Researcher: *As I understand it you have new graduates working in your Department. From your experience of them do you think that there is a gap between what they are taught in the school and what they do in practice?*

Sedairi: Yes, in this sense there is a gap.

Researcher: *How does this gap manifest itself in the new graduates that you receive here?*

Sedairi: While most of the graduates can do basic design their designs lack practical aspects. For example, they cannot design to budget, and they do not take into consideration climatic concerns. I mean such things as how much it is going to cost to air-condition a house or a building, and what we can do to minimise this cost by, for example, reducing the interior volumes, or minimising the use of glass, or by utilising shading devices, etc. I can also tell you that most of the graduates, if not all of them, are unable to do working drawing, they know nothing about architectural details and specification, and they are completely in the dark about the notion of bills of quantities. So from my own experience the graduates are capable of doing the working design, but they are unaware that there is much work involved after the laying out of a design. I think that the students in the schools should study architectural design for three years, and then in the last two years they should specialise, some in site supervision, some in working drawing, some in architectural details, and so on. One more thing I would like to mention quickly which is a problem that we face here all the time. It is about the quality of design. Although the schools of architecture in Saudi Arabia emphasise design over other subjects, the graduate's work is usually superficial at the level of concepts and theories. They usually try to satisfy the functional requirement of a building in their designs. But the overall design, the overall form and appearance of the building lack a philosophy and a concept. For example, they can provide in their works the right number of offices, the right number of lounges, of facilities and so on, but they place all of this in a box. I am talking here about the creativity in design that the new graduates lack. Some of the students try to be creative but the take the wrong path for that. They use in their designs bizarre forms and shapes such as circles and curves without an underlying idea and concept. To remedy this, I think the students should be extensively exposed during their training to quality projects from all over the world. They should be taught the theories and concepts behind those quality projects. Books, slides, periodicals, and CD-ROM's should be available in the schools for the students to see and feel what a good concept in architecture is all about.

Researcher: *Why do you think there is a gap between architectural education and practice?*

Sedairi: I think that the relationship between the school and the practice is not close enough. The school does not know the exact needs of the market or how the practice operates. In our Department, for instance, we need site supervisors, we need architects who can work on working drawings and architectural details, and the writing of specifications, we need architects who can put forward the design concepts. But we don't get them. And, as I told you, there must be a co-ordination between the school and the needs of practice.

Researcher: *At the end of this interview would you like to add anything?*

Sedairi: The students have shortcomings on architectural presentation and model making. Also they don't know how to use computers, and everything is done with computers nowadays. Of course I am talking about the graduates of King Saud University because most of our graduates come from there. I don't know about other universities.

Interview 14

Shoabi, Ali

Researcher: *Could you give me some information about your educational background?*

Shoabi: I have graduated from King Saud University in the seventies. After that I established *Beeah* architectural firm. We have won the Aga Khan award three times and many international awards for the work we did for the Kingdom.

Researcher: *From your long experience, do you think there is a gap between architectural education and practice?*

Shoabi: Yes, I think there is. From my experience with new graduates who work in my office and from my experience with students during their summer training I can tell you that there is indeed a gap.

Researcher: *How does this gap manifest itself in the graduate's performance?*

Shoabi: There are shortcomings amongst the graduates in their approach to design. When I employ new graduates I usually give them just a small project to do, like a house. So when they start designing the house they begin with a basic shape, say an 'L' shape or a square with a courtyard inside, and then they attempt to adapt other things to this basic shape. However, the right approach to design is to try to understand the relationship of the building to its environment, and whatever shape develops from this approach will be the right shape.

Also the graduates in their design do not take into consideration building and safety regulations, and the architectural details needed for their projects. Unfortunately not only do they not know how to do it, but they do not know how to get the information they need from references; they don't know how to get details, regulations, standards, etc., although we have all the material in our office. Information such as how many WCs you need for a building, how many fire escapes, are not guesswork but must be decided on study and understanding of the requirements.

There are also shortcomings amongst graduates in that they do not seem able to express themselves at the design stage with anything other than orthogonal shapes. They are all right with squares and so on, but they don't seem happy with less orthodox shapes. For one thing, they seldom think of making a basic design in less orthodox shapes themselves; for another, if they are given further work to do on, say, a curvilinear design, they are unable to provide adequate sketches of how such a building will appear in a three-dimensional form; and for another, some of them cannot do such sketches even for orthogonal designs.

There is also an inadequacy in the graduates' understanding of the relationship between the interaction of the building and its surrounding environment. For example, do the openings of the windows allow sufficient light and ventilation, or should they be slightly bigger or smaller? The new graduates don't know the basis on which they can judge this. These things have to be resolved by reference to books etc. They are not a matter of guesswork.

Another inadequacy that I would like to mention is that the concepts of economical and expensive are not clear in the graduates' minds. In the university they might tell the students in the design studio that something is economical, whereas in practice it is expensive, and vice versa. Sometimes they tell the students that something is expensive to do, but in practice, though initially more costly, it is cheaper in the long run. How to determine cost depends on the experience of the architect in cost analysis, and the teachers cannot teach this because they don't practise. They don't have this feel for it.

Researcher: *In your opinion what are the causes of all of these shortcomings?*

Shoabi: It relates to what you have mentioned – the gap between teachers and practitioners. There is not enough interaction between the schools and professional practice.

<u>APPENDIX IV</u>

Architectural Curricula Implemented at Schools of Architecture in Saudi Arabia (1987-1998)

King Saud University

College of Architecture and Planning, Riyadh

First Year *First Semester*

COURSE	TITLE	CONTACT	CREDIT
ENG 100	English Language	3	3
ARAB 101	Language Skills	2	2
ARCH 111	Basic Skills I	8	4
ARCH 112	Basic Design I	6	3
PL 113	Scope of Architecture and Planning	2	2
MATH 113	Mathematics For Architects and Planners I	5	3
	TOTAL	17	26

First Year *Second Semester*

COURSE	TITLE	CONTACT	CREDIT
IC 101	Introduction to Islamic Culture	2	2
ARAB 103	Exposition Writing	2	2
ARCH 121	Basic Skills II	8	4
ARCH 122	Basic Design II	8	4
ARCH 123	History of History	3	3
ENG 105	English Language	3	2
	TOTAL	17	26

Second Year *First Semester*

COURSE	TITLE	CONTACT	CREDIT
IC 102	Islamic and the Construction of Society	2	2
PL 223	Introduction to Computing for Architects and Planners	5	3
ENG 109	English Language	2	2
ARCH 210	Architectural Design I	10	5
ARCH 211	Introduction to Design Methodology	2	2
ARCH 212	Architectural Construction I	4	3
MATH 104	Mathematics for Architects II	5	3
	TOTAL	20	30

Second Year *Second Semester*

COURSE	TITLE	CONTACT	CREDIT
IC 103	The Islamic Economic System	2	2
ARCH 220	Architectural Design II	10	5
ARCH 221	Theories of Architecture I	2	2
ARCH 220	Architectural Construction II	4	3
ARCH 223	History of Muslim Architecture I	2	2
ARCH 224	Computer Aided Design	5	3
PHYS 105	Introductory Physics	4	3
	TOTAL	20	29

Third Year *First Semester*

COURSE	TITLE	CONTACT	CREDIT
PL 315	Landscape Architecture	3	2
ARCH 310	Architectural Design III	10	5
ARCH 311	Theories of Architecture II	3	3
ARCH 312	Architectural Construction III	4	3
ARCH 313	History of Muslim Architecture II	2	2
ARCH 314	Statics and Strengths of Materials	4	3
ARCH 315	Sanitary Services	2	2
TOTAL		*20*	*28*

Third Year *Second Semester*

COURSE	TITLE	CONTACT	CREDIT
PL 224	Introduction to Urban Design	3	2
ARCH 320	Architectural Design IV	10	5
ARCH 321	Climate and Architecture	3	3
ARCH 322	Architectural Details	4	2
ARCH 323	Housing	2	2
CE 269	Structural Analysis	2	3
ME 339	Mechanical Installations	2	2
TOTAL		*19*	*28*

OPTION ONE:

Fourth Year (Architectural Design) *First Semester*

COURSE	TITLE	CONTACT	CREDIT
PL 411	Man-Built Environment	3	3
ARCH 410	Architectural Design V	10	5
ARCH 411	Lighting and Acoustics	3	3
ARCH 412	Structural Systems in Architecture	4	3
CE 378	Design of Reinforced Concrete Structure I	3	2
AR 415	Interior Design	3	3
TOTAL		*19*	*26*

OPTION TWO:

Fourth Year (Building Science) *First Semester*

COURSE	TITLE	CONTACT	CREDIT
PL 411	Man-Built Environment	3	3
ARCH 410	Architectural Design V	10	5
ARCH 411	Lighting And Acoustics	3	3
ARCH 412	Structural Systems in Architectural	4	3
CE 378	Design of Reinforced Concrete Structure I	3	2
AR 417	Energy Conservation in Building	3	3
TOTAL		*19*	*26*

OPTION ONE:

Fourth Year (Architectural Design) — **Second Semester**

COURSE	TITLE	CONTACT	CREDIT
ARCH 420	Architectural Design VI	10	5
ARCH 421	Architectural Professional Practice	2	2
ARCH 422	Facility Programming	2	2
EE 309	Electrical Installations	2	2
CE 379	Design of Reinforced Concrete Structure II	4	3
AR 425	Special Topics in Humanities	3	3
TOTAL		17	23

OPTION TWO:

Fourth Year (Building Science) — **Second Semester**

COURSE	TITLE	CONTACT	CREDIT
ARCH 420	Architectural Design VI	10	5
ARCH 421	Architectural Professional Practice	2	2
ARCH 422	Facility Programming	2	2
EE 309	Electrical Installations	2	2
CE 379	Design of Reinforced Concrete Structure II	4	3
AR 427	New Construction Techniques in Building	3	3
TOTAL		17	23

OPTION ONE:

Fifth Year (Architectural Design) — **First Semester**

COURSE	TITLE	CONTACT	CREDIT
IC 104	Fundamentals of the Islamic Political System	2	2
ARCH 430	Architectural Design VII	10	5
ARCH 431	Contracts and Implementation Documents	4	3
ARCH 498	Graduation Project Program	4	2
AR 434	Traditional Architecture in Saudi Arabia	3	3
TOTAL		15	23

OPTION TWO:

Fifth Year (Building Science) — **First Semester**

COURSE	TITLE	CONTACT	CREDIT
IC 104	Fundamentals of the Islamic Political System	2	2
ARCH 430	Architectural Design VII	10	5
ARCH 431	Contracts and Implementation Documents	4	3
ARCH 498	Graduation Project Program	4	2
AR 436	Standardisation in Building	3	3
TOTAL		15	23

OPTION ONE:

Fifth Year (Architectural Design) ***Second Semester***

COURSE	*TITLE*	*CONTACT*	*CREDIT*
ACH 499	Graduation Project-Design	5	10
ARCH 441	Project Management	3	4
AR 445	Special Topics in Architectural Design	3	3
TOTAL		***17***	***11***

OPTION TWO:

Fifth Year (Building Science) ***Second Semester***

COURSE	*TITLE*	*CONTACT*	*CREDIT*
ARCH 499	Graduation Project-Design	10	5
ARCH 441	Project Management	4	3
AR 445	Special Topics in Building Technology	3	3
TOTAL		***17***	***11***

Total credit hours required in Degree Program: 175
Total contact hours required in Degree Program: 254

King Faisal University

College of Architecture and Planning, Dammam

First Year — *First Semester*

COURSE	TITLE	CONTACT	CREDIT
ARAR 100	Basic Design I	8	4
ARAR 111	Introduction to Environmental Design	2	2
ARBT 111	Mathematics I (Algebra)	3	3
DEIC 101	Islamic Studies I	2	2
DEFL 101	English Language	13	0
PHED 101	Physical Education I	1	1
	TOTAL	*29*	*12*

First Year — *Second Semester*

COURSE	TITLE	CONTACT	CREDIT
ARAR 101	Basic Design II	8	4
ARBT 112	Mathematics II (Algebra)	3	3
ARBT 122	Physics	3	3
DEIC 202	Islamic Studies II	2	2
DEFL 101	English Language	13	3
	TOTAL	*29*	*15*

Second Year — *First Semester*

COURSE	TITLE	CONTACT	CREDIT
ARAR 200	Design Studio I	10	5
ARAR 211	Design Methods I	2	2
ARBT 231	Construction I (Materials and Methods)	3	3
ARBT 241	Environmental Control I	3	3
ARBT 251	Concept of Structure I	3	3
DEIC 303	Islamic Studies III	2	2
	TOTAL	*23*	*18*

Second Year — *Second Semester*

COURSE	TITLE	CONTACT	CREDIT
ARAR 201	Design Studio II	10	5
ARAR 212	Design Methods II	2	2
ARBT 232	Construction II (Systems)	3	3
ARBT 242	Environmental Control II	3	3
ARBT 252	Concept of Structure II	3	3
DEIC 404	Islamic Studies IV	2	2
	TOTAL	*23*	*18*

Third Year *First Semester*

COURSE	TITLE	CONTACT	CREDIT
ARAR 300	Design Studio III	10	5
ARBT 332	Construction III (Advanced Building Systems)	3	3
ARAR 321	History and Theories of Architecture I	3	3
ARAR 311	Design Methods III	2	2
ARAR 371	Computer Applications in Architecture	2	2
ARBT 381	Surveying	3	3
TOTAL		*23*	*18*

Third Year *Second Semester*

COURSE	TITLE	CONTACT	CREDIT
ARAR 301	Design Studio IV	12	6
ARAR 322	History and Theories of Architecture II	3	3
ARAR 352	Structure and Form	3	3
ARAR 312	Housing and Settlements	3	3
ARBT 372	Computer Applications in Architecture II	2	2
TOTAL		*23*	*17*

Fourth Year *First Semester*

COURSE	TITLE	CONTACT	CREDIT
ARAR 401	Design Studio V	12	6
ARAR 411	Introduction to Urban Design and Methods	3	3
ARAR 421	History and Theories of Architecture III	3	3
ARAR 461	Construction Document	3	3
	Elective I	3	3
TOTAL		*24*	*18*

Fourth Year *Second Semester*

COURSE	TITLE	CONTACT	CREDIT
ARAR 401	Design Studio VI	12	6
ARAR 412	Introduction to Planning and Methods	3	3
ARAR 422	History and Theories of Architecture IV	3	3
ARAR 462	Research Methods in Architecture	2	2
ARAR 492	Senior Project Seminar	1	1
	Elective II	3	3
TOTAL		*24*	*18*

Fifth Year			*First Semester*
COURSE	*TITLE*	*CONTACT*	*CREDIT*
ARAR 501	Design Studio VII	12	6
ARAR 511	Research and Programming	3	3
ARAR 521	Contemporary Issues in Architecture	3	3
ARAR 561	Costing and Management	3	3
	Elective III	3	3
TOTAL		*24*	*18*

Fifth Year			*Second Semester*
COURSE	*TITLE*	*CONTACT*	*CREDIT*
ARAR502	Design Studio VIII	14	7
ARAR562	Professional Practice	3	3
	Elective IV	3	3
TOTAL		*20*	*13*

Total credit hours required in Degree Program: 165
Total contact hours required in Degree Program: 242

King Abdul-Aziz University

School of Environmental Design, Jeddah

First Year *First Semester*

COURSE	*TITLE*	*LECTURE*	*LAB*	*CONTACT*	*CREDIT*
AR 190	Visual Communication	0	8	8	4
LA 121	Introduction to Environmental Design	2	0	2	2
Math 101	Math for Environmental Design	4	0	4	4
ISLAS 101	Islamic Studies I	2	0	2	2
LANG 111	English for Architecture	0	12	12	1
TOTAL		*8*	*20*	*28*	*13*

First year *Second Semester*

COURSE	*TITLE*	*LECTURE*	*LAB*	*CONTACT*	*CREDIT*
AR 191	Basic Design	0	8	8	4
URP 130	Evolution of the Built Environment	3	0	3	3
LA 141	Environment and Man	3	0	3	3
LANG 112	English for Architecture	0	12	12	2
PHYS 101	Physics for Architecture	3	3	6	4
TOTAL		*9*	*23*	*32*	*16*

Second Year *First Semester*

COURSE	*TITLE*	*LECTURE*	*LAB*	*CONTACT*	*CREDIT*
AR 192	Architectural Design Studio I	0	12	12	6
AR 110	Free Hand Drawing	0	4	4	2
AR 130	Architecture in Islamic Civilization	3	0	3	3
URP 111	Computer for Environmental Design	1	3	4	2
LA 122	Site Planning	2	0	2	2
ARAB 101	Arabic Language I	3	0	3	3
TOTAL		*9*	*19*	*28*	*18*

Second Year *Second Semester*

COURSE	*TITLE*	*LECTURE*	*LAB*	*CONTACT*	*CREDIT*
AR 193	Architectural Design Studio II	0	12	12	6
AR 111	Architectural Presentation	0	4	4	2
AR 112	Computer Application in Architecture	1	4	5	3
AR 140	Energy and Design	3	0	3	3
LA 150	Survey for Environmental Design	1	2	3	2
ARAB 201	Arabic Language II	3	0	3	3
TOTAL		*8*	*22*	*30*	*19*

Third Year *First Semester*

COURSE	TITLE	LECTURE	LAB	CONTACT	CREDIT
AR 294	Architectural Design Studio II	0	12	12	6
AR 213	Architectural Presentation By CAD	1	4	5	3
AR 270	Building Construction: Material and	2	0	2	2
AR 260	Structure in Architecture I	3	0	3	3
AR 220	Comparative Architectural thoughts I	3	0	3	3
	TOTAL	*9*	*16*	*25*	*17*

Third Year *Second Semester*

COURSE	TITLE	LECTURE	LAB	CONTACT	CREDIT
AR 295	Architectural Design Studio IV	0	12	12	6
AR 271	Building Construction: Material and	2	0	2	2
AR 261	Structure in Architecture II	3	0	3	3
AR 221	Comparative Architectural thoughts II	3	0	3	3
AR 231	Saudi Architectural Heritage	2	0	2	2
ISLAS 201	Islamic Studies II	2	0	2	2
	TOTAL	*12*	*12*	*24*	*18*

Forth Year *First Semester*

COURSE	TITLE	LECTURE	LAB	CONTACT	CREDIT
AR 396	Architectural Design Studio V	0	12	12	6
URP 300	Housing I	3	0	3	3
AR 341	Mechanical and Sanitary Systems in	3	0	3	3
AR 372	Working Drawings I	1	6	7	4
ISLAS 301	Islamic Studies III	2	0	2	2
	TOTAL	*9*	*18*	*27*	*18*

Forth Year *Second Semester*

COURSE	TITLE	LECTURE	LAB	CONTACT	CREDIT
AR 397	Architectural Design Studio VI	0	12	12	6
URP 303	Urban Design	3	0	3	3
AR 351	Acoustic and Illumination in	2	0	2	2
AR 373	Working Drawings II	1	6	7	4
AR 332	Psychology and Sociology in	2	0	2	2
AR	Elective	2	0	2	2
	TOTAL	*10*	*18*	*28*	*19*

Fifth Year *First Semester*

COURSE	*TITLE*	*LECTURE*	*LAB*	*CONTACT*	*CREDIT*
AR 498	Architectural Design Studio VII	0	12	12	6
AR 400	Graduation Project Research	2	0	2	2
AR 475	Project Management	3	0	3	3
ISLAS 401	Islamic Studies IV	2	0	2	2
AR	Elective	2	0	2	2
TOTAL		*9*	*12*	*21*	*15*

Fifth Year *Second Semester*

COURSE	*TITLE*	*LECTURE*	*LAB*	*CONTACT*	*CREDIT*
AR 499	Graduation Project	0	16	16	8
AR 476	Professional Practice	2	0	2	2
AR	Elective	2	0	2	2
TOTAL		*4*	*16*	*20*	*12*

Total credit hours required in Degree Program: 165

Total contact hours required in Degree Program: 263

King Fahad University

College of Environmental Design, Dahran

First Year (Preparatory) *First Semester*

COURSE	TITLE	LECTURE	LAB	CONTACT	CREDIT
ENGL 001	Preparatory English I	15	5	20	8
MATH 001	Preparatory Math I	3	1	4	4
ME 001	Preparatory Shop I	0	2	2	1
PE 001	Physical Education I	0	2	2	1
TOTAL		*18*	*10*	*28*	*14*

First Year (Preparatory) *second Semester*

COURSE	TITLE	LECTURE	LAB	CONTACT	CREDIT
ENGL 002	Preparatory English II	15	5	20	8
MATH 002	Preparatory Math II	3	1	4	4
ME 002	Preparatory Shop II	0	2	2	1
PB 002	Physical Education II	0	2	2	1
TOTAL		*18*	*10*	*28*	*14*

Second Year (Freshman) *First Semester*

COURSE	TITLE	LECTURE	LAB	CONTACT	CREDIT
ARC 100	Graphics Communication	0	12	12	6
ARC 110	History of Architecture I	2	0	2	2
ENGL 101	English Composition I	3	0	3	3
MATH 131	Finite Mathematics	3	0	3	3
PHYS 131	Physics for Architects I	3	3	6	4
PE 101	Physical Education I	0	2	2	1
TOTAL		*11*	*17*	*28*	*19*

Second Year (Freshman) *Second Semester*

COURSE	TITLE	LECTURE	LAB	CONTACT	CREDIT
ARC 100	Design Studio I	0	12	12	6
ARC 110	History of Architecture II	2	0	2	2
ENGL 101	English Composition II	3	0	3	3
MATH 131	Applied Calculus	3	0	3	3
PHYS 131	Physics for Architects II	3	3	6	4
PB 101	Physical Education II	0	2	2	1
TOTAL		*11*	*17*	*28*	*19*

Summer Session

COURSE	TITLE	LECTURE	LAB	CONTACT	CREDIT
LAS 111	Islamic Ideology	2	2	4	2
LAS 200	Introduction to Arabic Essay	2	0	2	2
TOTAL		*4*	*2*	*6*	*4*

Third Year (Sophomore) *First Semester*

COURSE	TITLE	LECTURE	LAB	CONTACT	CREDIT
ARC 202	Design Studio II	0	12	12	6
ARC 210	History of Architecture III	2	0	2	2
ARC 222	Structure in Architecture I	3	0	3	3
ARC 231	Intro to Urban Design Concept	2	0	2	2
ARE 211	Construction Material	3	0	3	3
ICS 101	Computer Programming	1	3	4	2
PB 201	Physical Education III	0	2	2	1
TOTAL		*11*	*17*	*28*	*19*

Third Year (Sophomore) *Second Semester*

COURSE	TITLE	LECTURE	LAB	CONTACT	CREDIT
ARC 203	Design Studio III	0	12	12	6
ARC 221	Structure in Architecture II	2	3	5	3
ARE 212	Construction Systems	3	0	3	3
ARE 221	Computer Graphics	2	3	5	3
ENGL 214	Technical Report Writing	3	0	3	3
PB 201	Physical Education IV	0	2	2	1
TOTAL		*10*	*20*	*30*	*19*

Fourth Year (Junior) *First Semester*

COURSE	TITLE	LECTURE	LAB	CONTACT	CREDIT
ARC 304	Design Studio IV	0	12	12	6
ARC 313	Theories of Architecture I	2	0	2	2
ARC 323	Structure in Architecture III	2	3	5	3
ARC 332	Housing Design	2	0	2	2
LAS 222	The Qur'an and *Sunnah*	2	0	2	2
LAS 300	Arabic Terminology	2	0	2	2
ARC 3xx	Elective I	2	0	2	2
TOTAL		*12*	*15*	*27*	*19*

Fourth Year (Junior) *Second Semester*

COURSE	TITLE	LECTURE	LAB	CONTACT	CREDIT
ARC 305	Design Studio V	0	12	12	6
CE260	Surveying I	2	3	5	3
ARE 322	Mechanical Systems	2	3	5	3
ARE 331	Building Economy	3	0	3	3
LAS333	The Islamic System	2	0	2	2
ARC 3xx	Elective II	2	0	2	2
TOTAL		*11*	*18*	*29*	*19*

Summer Session

COURSE	TITLE	LECTURE	LAB	CONTACT	CREDIT
ARC 300	Workshop	0	3	3	1

Fifth Year (Senior) *First Semester*

COURSE	*TITLE*	*LECTURE*	*LAB*	*CONTACT*	*CREDIT*
ARC 406	Design Studio VI	0	12	12	6
ARC 400	Senior Project Preparation	1	0	1	1
ARC 414	Theories of Architecture II	2	0	2	2
ARC 433	Design in Arid Region	2	0	2	2
ARE 321	Acoustics and Illumination	2	3	5	3
LAS 400	Arabic Syntax	2	0	2	2
ARC 4xx	Elective III	2	0	2	2
TOTAL		11	15	26	18

Fifth Year (Senior) *Second Semester*

COURSE	*TITLE*	*LECTURE*	*LAB*	*CONTACT*	*CREDIT*
ARC 408	Senior Project	0	14	14	7
ARC 434	Perception, Geometry and	2	0	2	2
ARC 435	Professional Laws & Regulations	2	0	2	2
ARE 414	Contracts & Specifications	3	0	3	3
ARC 4xx	Elective IV	2	0	2	2
LAS xxx	Elective	2	0	2	2
TOTAL		*11*	*14*	*25*	*18*

Total credit hours required in Degree Program: 183

Total contact hours required in Degree Program: 286

Umm Al-Qura University

College of Engineering and Islamic Architecture, Makkah

First Year — *First Semester*

COURSE	TITLE	CONTACT	CREDIT
0801-101	Design Studio I	11	5
0801-111	Basic Science For Architecture I	2	2
0801-121	Workshop I	2	2
0801-131	Descriptive Geometry For Architecture	4	2
0601-101	Islamic Studies I	2	2
0605-101	Quran I	2	2
	TOTAL	*23*	*15*

First Year — *Second Semester*

COURSE	TITLE	CONTACT	CREDIT
0801-102	Design Studio II	11	5
0801-112	Basic Science For Architecture II	2	2
0801-122	Workshop II	2	2
0801-142	Design Process	1	1
0801-152	Perspective, Shade and shadow	2	2
0801-162	Islamic Science I	1	1
0801-172	Materials Property	1	1
0705-101	English Language I	6	2
	TOTAL	*26*	*16*

Second Year — *First Semester*

COURSE	TITLE	CONTACT	CREDIT
0801-201	Design Studio III	11	5
0801-211	Architecture of Ancient Civilization	2	2
0801-241	Building Construction I	2	2
0801-251	Theories of Architectural Design	1	1
0801-261	Islamic Science II	1	1
0801-271	Research Methodology	1	1
0803-225	Structure I	2	2
0705-102	English Language II	4	2
0501-101	Arabic Language	3	2
	TOTAL	*27*	*18*

Second Year — *Second Semester*

COURSE	TITLE	CONTACT	CREDIT
0801-202	Design Studio IV	11	5
0801-212	Islamic Architecture	2	2
0801-242	Building Construction II	2	2
0801-252	Theories of Architecture I	2	2
0801-262	Islamic Science III	1	1
0801-282	Introduction to Computing	2	2
0803-226	Structure II	2	2
0705-103	English Language III	4	2
	TOTAL	*26*	*18*

Third Year *First Semester*

COURSE	TITLE	CONTACT	CREDIT
0801-301	Design Studio V	11	5
0801-311	Surveying	4	2
0801-341	Building Construction III	2	2
0801-351	Theories of Architecture II	2	2
0801-361	Islamic Science IV	1	1
0801-371	Urban Design I	2	2
0801-381	Building Science I	2	2
0801-391	Computer Aided Drafting I	4	2
0803-325	Structure III	2	2
	TOTAL	***30***	***20***

Third Year · *Second Semester*

COURSE	TITLE	CONTACT	CREDIT
0801-302	Design Studio VI	11	5
0801-332	Housing	2	2
0801-342	Building Construction IV	2	2
0801-372	Urban Design II	2	2
0801-382	Building Science II	2	2
0801-392	Computer Aided Drafting II	4	2
0803326	Structure IV	2	2
0601-201	Islamic Studies II	2	2
0605-201	Holy Quran II	2	2
	TOTAL	***29***	***21***

Summer Session

COURSE	TITLE	CREDIT
0801-395	Summer Training I (Traditional Site Surveying)	2

Fourth Year *First Semester*

COURSE	TITLE	CONTACT	CREDIT
0801-401	Design Studio VII	11	5
0801-411	Design of Interior Spaces I	2	2
0801-341	Contemporary Islamic Architecture	2	2
0801-441	Design of Exterior Spaces	2	2
0801-425	Structure V	2	2
0601-301	Islamic Studies III	3	3
0605-301	Holy Quran III	2	2
	TOTAL	***24***	***18***

Fourth Year *Second Semester*

COURSE	TITLE	CONTACT	CREDIT
0801-402	Design Studio VIII	14	6
0801-412	Design of Interior Spaces II	2	2
0801-442	Landscape Architecture	2	2
0601-401	Islamic Studies IV	2	2
0605-401	Holy Quran IV	2	2
	TOTAL	***22***	***14***

Summer Session

COURSE	*TITLE*	*CREDIT*
0801-445	Summer Training II (Office Training)	2

Fifth Year ***First Semester***

COURSE	*TITLE*	*CONTACT*	*CREDIT*
0801-451	Design Studio IX	14	6
0801-461	Construction Management	2	2
0801-471	Building Economics	2	2
0801-481	Islamic Principles for Architecture	2	2
0801-491	Graduation Project	1	1
TOTAL		***21***	***13***

Fifth Year ***Second Semester***

COURSE	*TITLE*	*CONTACT*	*CREDIT*
0801-452	Design Studio X	14	6
0801-482	Contemporary Built Environment	2	2
0201-112	The Prophet's Life	2	2
TOTAL		***18***	***10***

Total credit hours required in Degree Program: 167

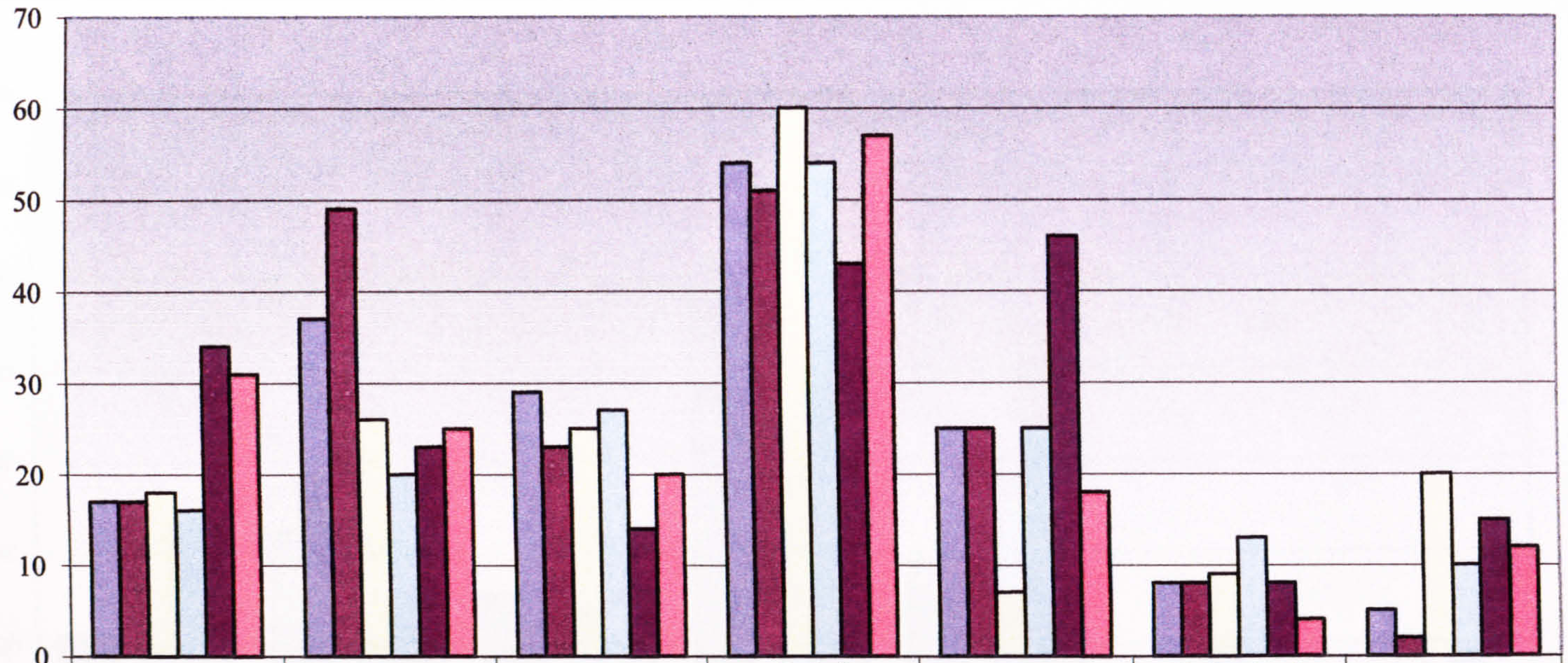
Total contact hours required in Degree Program: 246

APPENDIX V

Subject Classification of Architectural Curricula Implemented at Schools of Architecture in Saudi Arabia (1987-1998)

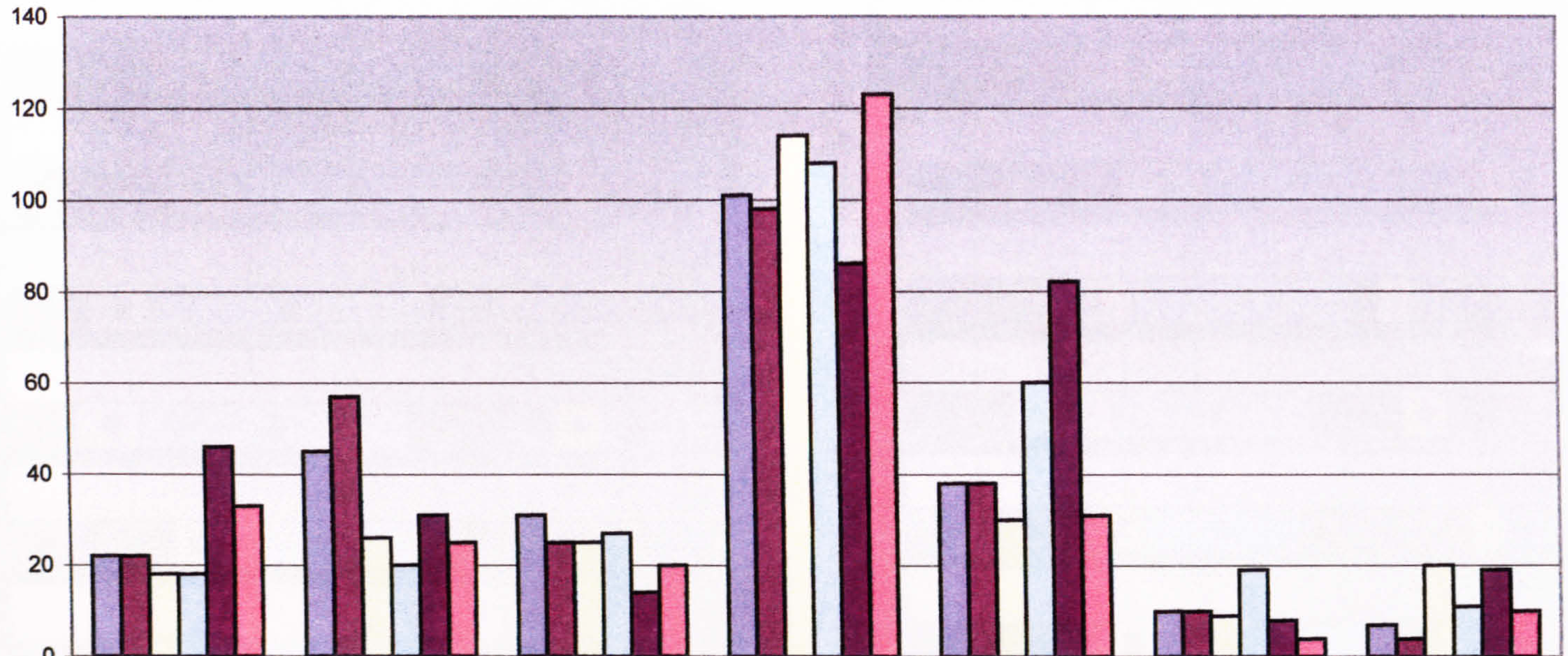
University	King Saud (Arch. Design)	King Saud (Bld. Science)	King Faisal	King Abdul-Aziz	King Fahad	Umm Al-Qura	King Saud (Arch. Design)	King Saud (Bld. Science)	King Faisal	King Abdul-Aziz	King Fahad	Umm Al-Qura
	CREDIT HOURS						***CONTACT HOURS***					
BASIC SUBJECTS												
Islamic Studies	8	8	8	8	6	25	8	8	8	8	8	25
Basic Sciences	9	9	9	8	22	6	14	14	9	10	26	8
Others	0	0	1	0	6	0	0	0	1	0	12	0
Total	**17**	**17**	**18**	**16**	**34**	**31**	**22**	**22**	**18**	**18**	**46**	**33**
BUILDING TECHNOLOGY												
Building Construction	11	20	9	4	6	11	16	25	9	4	6	11
Building Sciences	12	15	8	10	8	4	12	15	8	10	12	4
Structure	14	14	9	6	9	10	17	17	9	6	13	10
Total	**37**	**49**	**26**	**20**	**23**	**25**	**45**	**57**	**26**	**20**	**31**	**25**
SOCIAL STUDIES AND HUMANITIES												
History And Theory	18	12	16	16	10	12	18	12	16	16	10	12
Context And Surrounding	11	11	9	11	4	8	13	13	9	11	4	8
Total	**29**	**23**	**25**	**27**	**14**	**20**	**31**	**25**	**25**	**27**	**14**	**20**
PROJECT PREPARATION AND DESIGN												
Design Theory And Methodology	7	4	6	0	0	4	7	4	6	0	0	4
Design Studio	47	47	54	54	43	53	94	94	108	108	86	119
Total	**54**	**51**	**60**	**54**	**43**	**57**	**101**	**98**	**114**	**108**	**86**	**123**
COMMUNICATION												
written and Oral	11	11	3	9	31	8	12	12	26	30	55	17
Presentation techniques	14	14	4	16	15	10	26	26	4	30	27	14
Total	**25**	**25**	**7**	**25**	**46**	**18**	**38**	**38**	**30**	**60**	**82**	**31**
PROFESSIONAL PRACTICE AND MANAGEMENT												
Professional Practice	5	5	6	5	8	4	6	6	6	5	8	4
Construction document	3	3	3	8	0	0	4	4	3	14	0	0
Total	**8**	**8**	**9**	**13**	**8**	**4**	**10**	**10**	**9**	**19**	**8**	**4**
COMPLEMENTARY STUDIES												
Electives	0	0	12	6	10	0	0	0	12	6	10	0
Research and written dissertation.	2	2	5	2	1	2	4	4	5	2	1	2
Others	3	0	3	2	4	10	3	0	3	3	8	8
Total	**5**	**2**	**20**	**10**	**15**	**12**	**7**	**4**	**20**	**11**	**19**	**10**
TOTAL	**175**	**175**	**165**	**165**	**183**	**167**	**254**	**254**	**242**	**263**	**286**	**246**

Credit and contact hours distribution of major subjects group of schools of architecture in Saudi Arabia



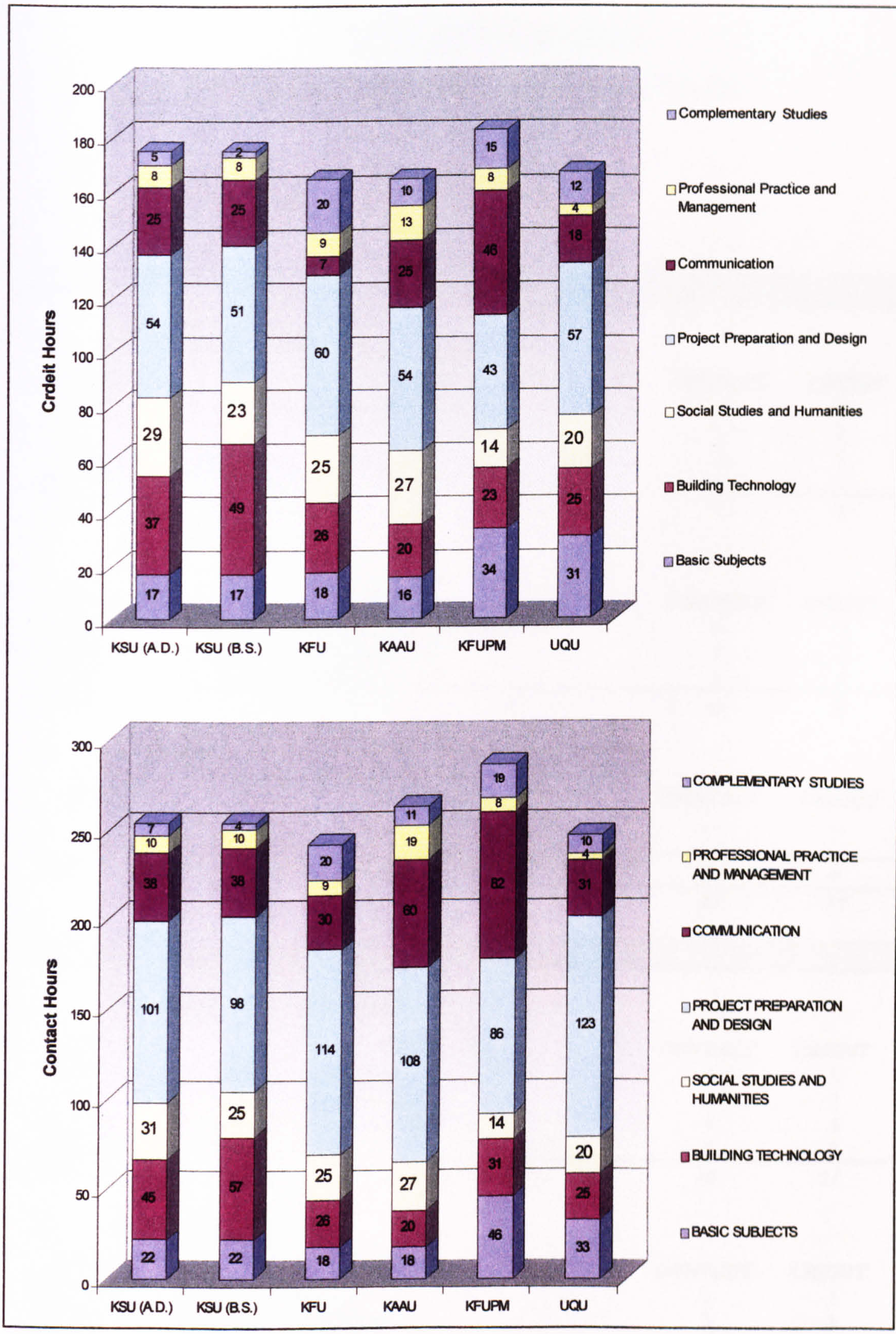
	Basic Subjects	Building Technology	Social Studies and Humanities	Project Preparation and Design	Communication	Professional Practice and Management	Complementary Studies
King Saud (Arch. Design)	17	37	29	54	25	8	5
King Saud (Bld. Scien.)	17	49	23	51	25	8	2
King Faisal	18	26	25	60	7	9	20
King Abdul-Aziz	16	20	27	54	25	13	10
King Fahad	34	23	14	43	46	8	15
Umm Al-Qura	31	25	20	57	18	4	12

Credit hours distribution of major subjects group of schools of architecture in Saudi Arabia



	BASIC SUBJECTS	BUILDING TECHNOLOGY	SOCIAL STUDIES AND HUMANITIES	PROJECT PREPARATION AND DESIGN	COMMUNICATION	PROFESSIONAL PRACTICE AND MANAGEMENT	COMPLEMENTARY STUDIES
King Saud (Arch. Design)	22	45	31	101	38	10	7
King Saud (Bld. Science)	22	57	25	98	38	10	4
King Faisal	18	26	25	114	30	9	20
King Abdul-Aziz	18	20	27	108	60	19	11
King Fahad	46	31	14	86	82	8	19
Umm Al-Qura	33	25	20	123	31	4	10

Contact hours distribution of major subjects group of schools of architecture in Saudi Arabia



A university by university comparison of credit and contact hours distribution of architecture curricula of schools of architecture in Saudi Arabia

King Saud University

College of Architecture and Planning, Riyadh

Architecture Curriculum

(Architectural Design Option)

A. BASIC SUBJECTS

1. ISLAMIC STUDIES

COURSE	*TITLE*	*CONTACT*	*CREDIT*
IC 101	Introduction to Islamic Culture	2	2
IC 102	Islam and the Construction of Society	2	2
IC 103	The Islamic Economic System	2	2
IC 104	Fundamentals of the Islamic Political System	2	2
Total		*8*	*8*

2. BASIC SCIENCE

COURSE	*TITLE*	*CONTACT*	*CREDIT*
MATH 113	Mathematics for Architects and Planners I	5	3
MATH 104	Mathematics for Architects II	5	3
PHYS 105	Introductory Physics	4	3
Total		*14*	*9*

3. OTHERS

COURSE	*TITLE*	*CONTACT*	*CREDIT*
--	--	--	--
Total		*0*	*0*
		22	*17*

B. BUILDING TECHNOLOGY

4. BUILDING CONSTRUCTION

COURSE	*TITLE*	*CONTACT*	*CREDIT*
ARCH 212	Architectural Construction I	4	3
ARCH 220	Architectural Construction II	4	3
ARCH 312	Architectural Construction III	4	3
ARCH 322	Architectural Details	4	2
Total		*16*	*11*

5. BUILDING SCIENCE

COURSE	*TITLE*	*CONTACT*	*CREDIT*
ARCH 315	Sanitary Services	2	2
ARCH 321	Climate and Architecture	3	3
ME 339	Mechanical Installations	2	2
ARCH 411	Lighting and Acoustics	3	3
EE 309	Electrical Installations	2	2
Total		*12*	*12*

6. STRUCTURE

COURSE	TITLE	CONTACT	CREDIT
ARCH 314	Statics and Strengths of Materials	4	3
CE 269	Structural Analysis	2	3
CE 378	Design of Reinforced Concrete Structure I	3	2
CE 379	Design of Reinforced Concrete Structure II	4	3
ARCH 412	Structural Systems in Architecture	4	3
Total		*17*	*14*
		45	*37*

C. SOCIAL STUDIES AND HUMANITIES

7. HISTORY AND THEORY

COURSE	TITLE	CONTACT	CREDIT
ARCH 123	History of History	3	3
ARCH 221	Theories of Architecture I	2	2
ARCH 223	History of Muslim Architecture I	2	2
ARCH 311	Theories of Architecture II	3	3
ARCH 313	History of Muslim Architecture II	2	2
AR 425	Special Topics in Humanities *	3	3
AR 434	Traditional Architecture in Saudi Arabia *	3	3
Total		*18*	*18*

8. CONTEXT AND SURROUNDING

COURSE	TITLE	CONTACT	CREDIT
PL 113	Scope of Architecture and Planing	2	2
PL 315	Landscape Architecture	3	2
PL 224	Introduction to Urban Design	3	2
ARCH 323	Housing	2	2
PL 411	Man-Built Environment	3	3
Total		*13*	*11*
		31	*29*

D. PROJECT PREPARATION AND DESIGN

9. DESIGN THEORY AND METHODOLOGY

COURSE	TITLE	CONTACT	CREDIT
ARCH 211	Introduction to Design Methodology	2	2
ARCH 422	Facility Programming	2	2
AR 445	Special Topics in Architectural Design *	3	3
Total		*7*	*7*

10. DESIGN STUDIO

COURSE	TITLE	CONTACT	CREDIT
ARCH 112	Basic Design I	6	3
ARCH 122	Basic Design II	8	4
ARCH 210	Architectural Design I	10	5
ARCH 220	Architectural Design II	10	5
ARCH 310	Architectural Design III	10	5
ARCH 320	Architectural Design IV	10	5
ARCH 410	Architectural Design V	10	5
ARCH 420	Architectural Design VI	10	5
ARCH 430	Architectural Design VII	10	5
ARCH 499	Graduation Project – Design	10	5
Total		*94*	*47*
		101	*54*

F. COMMUNICATION

15 WRITTEN AND ORAL

COURSE	TITLE	CONTACT	CREDIT
ENG 100	English Language	3	3
ARAB 101	Language Skills	2	2
ARAB 103	Exposition Writing	2	2
ENG 105	English Language	3	2
ENG 109	English Language	2	2
Total		***12***	***11***

16. PRESENTATION TECHNIQUES

COURSE	TITLE	CONTACT	CREDIT
ARCH 111	Basic Skills I	8	4
ARCH 121	Basic Skills II	8	4
PL 213	Introduction to Computing for Architects and Planners	5	3
ARCH 224	Computer Aided Design	5	3
Total		***26***	***14***
		38	***25***

G. PROFESSIONAL PRACTICE AND MANAGEMENT

17. PROFESSIONAL PRACTICE

COURSE	TITLE	CONTACT	CREDIT
ARCH 421	Architectural Professional Practice	2	2
ARCH 441	Project Management	4	3
Total		***6***	***5***

18. CONSTRUCTION DOCUMENT

COURSE	TITLE	CONTACT	CREDIT
ARCH 431	Contracts and Implementation Documents	4	3
Total		***4***	***3***
		10	***8***

E COMPLEMENTARY STUDIES

13. ELECTIVE COURSES

COURSE	TITLE	CONTACT	CREDIT
--	--	--	--
Total		***0***	***0***

13. RESEARCH AND WRITTEN DISSERTATION

COURSE	TITLE	CONTACT	CREDIT
ARCH 498	Graduation Project Program	4	2
Total		***4***	***2***

11. OTHERS

COURSE	TITLE	CONTACT	CREDIT
AR 415	Interior Design *	3	3
Total		***3***	***3***
		7	***5***

Total credit hours required in Degree Program: 175
Total contact hours required in Degree Program: 254
* *Architectural Design Optional Courses*

College of Architecture and Planning, Riyadh

Architecture Curriculum of 1998

(Building Science Option)

A. BASIC SUBJECTS

1. ISLAMIC STUDIES

COURSE	*TITLE*	*CONTACT*	*CREDIT*
IC 101	Introduction to Islamic Culture	2	2
IC 102	Islam and the Construction of Society	2	2
IC 103	The Islamic Economic System	2	2
IC 104	Fundamentals of the Islamic Political System	2	2
Total		***8***	***8***

2. BASIC SCIENCE

COURSE	*TITLE*	*CONTACT*	*CREDIT*
MATH 113	Mathematics for Architects and Planners I	5	3
MATH 104	Mathematics for Architects II	5	3
PHYS 105	Introductory Physics	4	3
Total		***14***	***9***

3. OTHERS

COURSE	*TITLE*	*CONTACT*	*CREDIT*
--	--	--	--
Total		***0***	***0***
		22	***17***

B. BUILDING TECHNOLOGY

4. BUILDING CONSTRUCTION

COURSE	*TITLE*	*CONTACT*	*CREDIT*
ARCH 212	Architectural Construction I	4	3
ARCH 220	Architectural Construction II	4	3
ARCH 312	Architectural Construction III	4	3
ARCH 322	Architectural Details	4	2
AR 427	New Construction Techniques in Building *	3	3
AR 445	Special Topics in Building Technology *	3	3
AR 436	Standardisation in Building *	3	3
Total		***25***	***20***

5. BUILDING SCIENCE

COURSE	*TITLE*	*CONTACT*	*CREDIT*
ARCH 315	Sanitary Services	2	2
ARCH 321	Climate and Architecture	3	3
ME 339	Mechanical Installations	2	2
ARCH 411	Lighting and Acoustics	3	3
EE 309	Electrical Installations	2	2
AR 417	Energy Conservation in Building *	3	3
Total		***15***	***15***

6. STRUCTURE

COURSE	*TITLE*	*CONTACT*	*CREDIT*
ARCH 314	Statics and Strengths of Materials	4	3
CE 269	Structural Analysis	2	3
CE 378	Design of Reinforced Concrete Structure I	3	2
CE 379	Design of Reinforced Concrete Structure II	4	3
ARCH 412	Structural Systems in Architecture	4	3
Total		***17***	***14***
		57	***49***

C. SOCIAL STUDIES AND HUMANITIES

7. HISTORY AND THEORY

COURSE	*TITLE*	*CONTACT*	*CREDIT*
ARCH 123	History of History	3	3
ARCH 221	Theories of Architecture I	2	2
ARCH 223	History of Muslim Architecture I	2	2
ARCH 311	Theories of Architecture II	3	3
ARCH 313	History of Muslim Architecture II	2	2
Total		***12***	***12***

8. CONTEXT AND SURROUNDING

COURSE	*TITLE*	*CONTACT*	*CREDIT*
PL 113	Scope of Architecture and Planing	2	2
PL 315	Landscape Architecture	3	2
PL 224	Introduction to Urban Design	3	2
ARCH 323	Housing	2	2
PL 411	Man-Built Environment	3	3
Total		***13***	***11***
		25	***23***

D. PROJECT PREPARATION AND DESIGN

9. DESIGN THEORY AND METHODOLOGY

COURSE	*TITLE*	*CONTACT*	*CREDIT*
ARCH 211	Introduction to Design Methodology	2	2
ARCH 422	Facility Programming	2	2
Total		***4***	***4***

10. DESIGN STUDIO

COURSE	*TITLE*	*CONTACT*	*CREDIT*
ARCH 112	Basic Design I	6	3
ARCH 122	Basic Design II	8	4
ARCH 210	Architectural Design I	10	5
ARCH 220	Architectural Design II	10	5
ARCH 310	Architectural Design III	10	5
ARCH 320	Architectural Design IV	10	5
ARCH 410	Architectural Design V	10	5
ARCH 420	Architectural Design VI	10	5
ARCH 430	Architectural Design VII	10	5
ARCH 499	Graduation Project – Design	10	5
Total		***94***	***47***
		98	***51***

F. COMMUNICATION

15 WRITTEN AND ORAL

COURSE	TITLE	CONTACT	CREDIT
ENG 100	English Language	3	3
ARAB 101	Language Skills	2	2
ARAB 103	Exposition Writing	2	2
ENG 105	English Language	3	2
ENG 109	English Language	2	2
Total		*12*	*11*

16. PRESENTATION TECHNIQUES

COURSE	TITLE	CONTACT	CREDIT
ARCH 111	Basic Skills I	8	4
ARCH 121	Basic Skills II	8	4
PL 213	Introduction to Computing for Architects and Planners	5	3
ARCH 224	Computer Aided Design	5	3
Total		*26*	*14*
		38	*25*

G. PROFESSIONAL PRACTICE AND MANAGEMENT

17. PROFESSIONAL PRACTICE

COURSE	TITLE	CONTACT	CREDIT
ARCH 421	Architectural Professional Practice	2	2
ARCH 441	Project Management	4	3
Total		*6*	*5*

18. CONSTRUCTION DOCUMENT

COURSE	TITLE	CONTACT	CREDIT
ARCH 431	Contracts and Implementation Documents	4	3
Total		*4*	*3*
		10	*8*

E COMPLEMENTARY STUDIES

13. ELECTIVE COURSES

COURSE	TITLE	CONTACT	CREDIT
--	--	--	--
Total		*0*	*0*

13. RESEARCH AND WRITTEN DISSERTATION

COURSE	TITLE	CONTACT	CREDIT
ARCH 498	Graduation Project Program	4	2
Total		*4*	*2*

11. OTHERS

COURSE	TITLE	CONTACT	CREDIT
--	--	--	
Total		*0*	*0*
		4	*2*

Total credit hours required in Degree Program: 175
Total contact hours required in Degree Program: 254
** Building Science Optional Courses*

King Faisal University

College of Architecture and Planning, Dammam

Architecture Curriculum

A. BASIC SUBJECTS

1. ISLAMIC STUDIES

COURSE	TITLE	CONTACT	CREDIT
DEIC 101	Islamic Studies I	2	2
DEIC 202	Islamic Studies II	2	2
DEIC 303	Islamic Studies III	2	2
DEIC 404	Islamic Studies IV	2	2
Total		*8*	*8*

2. BASIC SCIENCE

COURSE	TITLE	CONTACT	CREDIT
ARBT 111	Mathematics I (Algebra)	3	3
ARBT 112	Mathematics II (Algebra)	3	3
ARBT 122	Physics	3	3
Total		*9*	*9*

3. OTHERS

COURSE	TITLE	CONTACT	CREDIT
PHED 101	Physical Education I	1	1
Total		*1*	*1*
		18	*18*

B. BUILDING TECHNOLOGY

4. BUILDING CONSTRUCTION

COURSE	TITLE	CONTACT	CREDIT
ARBT 231	Construction I (Materials and Methods)	3	3
ARBT 232	Construction II (Systems)	3	3
ARBT 332	Construction III (Advanced Building Systems)	3	3
Total		*9*	*9*

5. BUILDING SCIENCE

COURSE	TITLE	CONTACT	CREDIT
ARAR 111	Introduction to Environmental Design	2	2
ARBT 241	Environmental Control I	3	3
ARBT 242	Environmental Control II	3	3
Total		*8*	*8*

6. STRUCTURE

COURSE	*TITLE*	*CONTACT*	*CREDIT*
ARBT 251	Concept of Structure I	3	3
ARBT 252	Concept of Structure II	3	3
ARAR 352	Structure and Form	3	3
Total		***9***	***9***
		26	***26***

C. SOCIAL STUDIES AND HUMANITIES

7. HISTORY AND THEORY

COURSE	*TITLE*	*CONTACT*	*CREDIT*
ARAR 321	History and Theories of Architecture I	3	3
ARAR 322	History and Theories of Architecture II	3	3
ARAR 421	History and Theories of Architecture III	3	3
ARAR 422	History and Theories of Architecture IV	3	3
ARAR 521	Contemporary Issues in Architecture	3	3
ARAR 492	Senior Project Seminar	1	1
Total		***16***	***16***

8. CONTEXT AND SURROUNDING

COURSE	*TITLE*	*CONTACT*	*CREDIT*
ARAR 312	Housing and Settlements	3	3
ARAR 411	Introduction to Urban Design and Methods	3	3
ARAR 412	Introduction to Planning and Methods	3	3
Total		***9***	***9***
		25	***25***

D. PROJECT PREPARATION AND DESIGN

9. DESIGN THEORY AND METHODOLOGY

COURSE	*TITLE*	*CONTACT*	*CREDIT*
ARAR 211	Design Methods I	2	2
ARAR 212	Design Methods II	2	2
ARAR 311	Design Methods III	2	2
Total		***6***	***6***

10. DESIGN STUDIO

COURSE	*TITLE*	*CONTACT*	*CREDIT*
ARAR 100	Basic Design I	8	4
ARAR 101	Basic Design II	8	4
ARAR 200	Design Studio I	10	5
ARAR 201	Design Studio II	10	5
ARAR 300	Design Studio III	10	5
ARAR 301	Design Studio IV	12	6
ARAR 401	Design Studio V	12	6
ARAR 402	Design Studio VI	12	6
ARAR 501	Design Studio VII	12	6
ARAR502	Design Studio VIII	14	7
Total		***108***	***54***
		114	***60***

F. COMMUNICATION

15 WRITTEN AND ORAL

COURSE	TITLE	CONTACT	CREDIT
DEFL 101	English Language	13	0
DEFL 101	English Language	13	3
Total		***26***	***3***

16. PRESENTATION TECHNIQUES

COURSE	TITLE	CONTACT	CREDIT
ARAR 371	Computer Applications in Architecture	2	2
ARBT 372	Computer Applications in Architecture II	2	2
Total		***4***	***4***
		30	***7***

G. PROFESSIONAL PRACTICE AND MANAGEMENT

17. PROFESSIONAL PRACTICE

COURSE	TITLE	CONTACT	CREDIT
ARAR562	Professional Practice	3	3
ARAR 561	Costing And Management	3	3
Total		***6***	***6***

18. CONSTRUCTION DOCUMENT

ARAR 461	Construction Document	3	3
Total		***3***	***3***
		9	***9***

E COMPLEMENTARY STUDIES

13. ELECTIVE COURSES

COURSE	TITLE	CONTACT	CREDIT
	Elective I	3	3
	Elective II	3	3
	Elective III	3	3
	Elective IV	3	3
Total		***12***	***12***

13. RESEARCH AND WRITTEN DISSERTATION

COURSE	TITLE	CONTACT	CREDIT
ARAR 462	Research Methods in Architecture	2	2
ARAR 511	Research and Programming	3	3
Total		***5***	***5***

11. OTHERS

COURSE	TITLE	CONTACT	CREDIT
ARBT 381	Surveying	3	3
Total		***3***	***3***
		20	***20***

Total credit hours required in Degree Program: 165
Total contact hours required in Degree Program: 242

King Abdul-Aziz University

School of Environmental Design, Jeddah

Architecture Curriculum

A. *BASIC SUBJECTS*

1. *ISLAMIC STUDIES*

COURSE	*TITLE*	*CONTACT*	*CREDIT*
ISLAS 101	Islamic Studies I	2	2
ISLAS 201	Islamic Studies II	2	2
ISLAS 301	Islamic Studies III	2	2
ISLAS 401	Islamic Studies IV	2	2
	TOTAL	***8***	***8***

2. *BASIC SCIENCE*

COURSE	*TITLE*	*CONTACT*	*CREDIT*
Math 101	Math for Environmental Design	4	4
PHYS 101	Physics for Architects	6	4
Total		***10***	***8***

3. *OTHERS*

COURSE	*TITLE*	*CONTACT*	*CREDIT*
--	--	--	--
Total		***0***	***0***
		18	***16***

B. *BUILDING TECHNOLOGY*

4. *BUILDING CONSTRUCTION*

COURSE	*TITLE*	*CONTACT*	*CREDIT*
AR 270	Building Construction: Materials and Methods I	2	2
AR 271	Building Construction: Materials and Methods II	2	2
Total		***4***	***4***

5. *BUILDING SCIENCE*

COURSE	*TITLE*	*CONTACT*	*CREDIT*
LA 121	Introduction to environmental Design	2	2
AR 140	Energy and Design	3	3
AR 341	Mechanical and Sanitary Systems in Architecture	3	3
AR 351	Acoustic and Illumination in Architecture	2	2
Total		***10***	***10***

6. *STRUCTURE*

COURSE	*TITLE*	*CONTACT*	*CREDIT*
AR 260	Structure in Architecture I	3	3
AR 261	Structure in Architecture II	3	3
Total		***6***	***6***
		20	***20***

C. SOCIAL STUDIES AND HUMANITIES

7. HISTORY AND THEORY

COURSE	TITLE	CONTACT	CREDIT
URP 130	Evolution of the Built Environment	3	3
AR 130	Architecture in Islamic Civilization	3	3
AR 220	Comparative Architectural Thoughts I	3	3
AR 221	Comparative Architectural Thoughts II	3	3
AR 231	Saudi Architectural Heritage	2	2
AR 332	Psychology and Sociology in Architecture	2	2
Total		***16***	***16***

8. CONTEXT AND SURROUNDING

COURSE	TITLE	CONTACT	CREDIT
LA 122	Site Planing	2	2
URP 300	Housing I	3	3
URP 303	Urban Design	3	3
LA 141	Environment and Man	3	3
Total		***11***	***11***
		27	***27***

D. PROJECT PREPARATION AND DESIGN

9. DESIGN THEORY AND METHODOLOGY

COURSE	TITLE	CONTACT	CREDIT
--	--	--	--
Total		***0***	***0***

10. DESIGN STUDIO

COURSE	TITLE	CONTACT	CREDIT
AR 191	Basic Design	8	4
AR 192	Architectural Design Studio I	12	6
AR 193	Architectural Design Studio II	12	6
AR 294	Architectural Design Studio III	12	6
AR 295	Architectural Design Studio IV	12	6
AR 396	Architectural Design Studio V	12	6
AR 397	Architectural Design Studio VI	12	6
AR 498	Architectural Design Studio VII	12	6
AR 499	Graduation Project	16	8
Total		***108***	***54***
		108	***54***

F. COMMUNICATION

15 WRITTEN AND ORAL

COURSE	TITLE	CONTACT	CREDIT
LANG 111	English for Architects	12	1
LANG 112	English for Architects	12	2
ARAB 101	Arabic Language I	3	3
ARAB 201	Arabic Language II	3	3
Total		***30***	***9***

16. PRESENTATION TECHNIQUES

COURSE	*TITLE*	*CONTACT*	*CREDIT*
AR 190	Visual communication	8	4
AR 110	Free Hand Drawing	4	2
URP 111	Computer For Environmental Design	4	2
AR 111	Architectural Presentation	4	2
AR 112	Computer Application in Architecture	5	3
AR 213	Architectural Presentation By CAD	5	3
Total		***30***	***16***
		60	***25***

G. PROFESSIONAL PRACTICE AND MANAGEMENT

17. PROFESSIONAL PRACTICE

COURSE	*TITLE*	*CONTACT*	*CREDIT*
AR 476	Professional Practice	2	2
AR 475	Project Management	3	3
Total		***5***	***5***

18. CONSTRUCTION DOCUMENTS

COURSE	*TITLE*	*CONTACT*	*CREDIT*
AR 372	Working Drawings I	7	4
AR 373	Working Drawings I	7	4
Total		***14***	***8***
		19	***13***

E COMPLEMENTARY STUDIES

13. ELECTIVE COURSES

COURSE	*TITLE*	*CONTACT*	*CREDIT*
AR	Elective	2	2
AR	Elective	2	2
AR	Elective	2	2
Total		***6***	***6***

13. RESEARCH AND WRITTEN DISSERTATION

COURSE	*TITLE*	*CONTACT*	*CREDIT*
AR 400	Graduation Project Research	2	2
Total		***2***	***2***

11. OTHERS

COURSE	*TITLE*	*CONTACT*	*CREDIT*
LA 150	Survey for Environmental Design	3	2
Total		***3***	***2***
		11	***10***

Total credit hours required in Degree Program: 165
Total contact hours required in Degree Program: 263

King Fahad University

College of Environmental Design, Dahran

A. BASIC SUBJECTS

1. ISLAMIC STUDIES

COURSE	TITLE	CONTACT	CREDIT
LAS 111	Islamic Ideology	4	2
LAS 222	The Qur'an and *Sunnah*	2	2
LAS333	The Islamic System	2	2
Total		***8***	***6***

2. BASIC SCIENCE

COURSE	TITLE	CONTACT	CREDIT
MATH 001	Preparatory Math I	4	4
MATH 002	Preparatory Math II	4	4
MATH 131	Finite Mathematics	3	3
PHYS 131	Physics for Architects I	6	4
MATH 131	Applied Calculus	3	3
PHYS 131	Physics for Architects II	6	4
Total		***26***	***22***

3. OTHERS

COURSE	TITLE	CONTACT	CREDIT
PE 001	Physical Education I	2	1
PB 002	Physical Education II	2	1
PE 101	Physical Education I	2	1
PB 101	Physical Education II	2	1
PB 201	Physical Education III	2	1
PB 201	Physical Education IV	2	1
Total		***12***	***6***
		46	***34***

B. BUILDING TECHNOLOGY

4. BUILDING CONSTRUCTION

COURSE	TITLE	CONTACT	CREDIT
ARE 211	Construction Material	3	3
ARE 212	Construction Systems	3	3
Total		***6***	***6***

5. BUILDING SCIENCE

COURSE	TITLE	CONTACT	CREDIT
ARE 322	Mechanical Systems	5	3
ARC 433	Design in Arid Region	2	2
ARE 321	Acoustics and Illumination	5	3
Total		***12***	***8***

6. STRUCTURE

COURSE	*TITLE*	*CONTACT*	*CREDIT*
ARC 222	Structure in Architecture I	3	3
ARC 221	Structure in Architecture II	5	3
ARC 323	Structure in Architecture III	5	3
Total		***13***	***9***
		31	***23***

C. SOCIAL STUDIES AND HUMANITIES

7. HISTORY AND THEORY

COURSE	*TITLE*	*CONTACT*	*CREDIT*
ARC 110	History of Architecture I	2	2
ARC 110	History of Architecture II	2	2
ARC 210	History of Architecture III	2	2
ARC 313	Theories of Architecture I	2	2
ARC 414	Theories of Architecture II	2	2
Total		***10***	***10***

8. CONTEXT AND SURROUNDING

COURSE	*TITLE*	*CONTACT*	*CREDIT*
ARC 231	Introduction to Urban Design Concept	2	2
ARC 332	Housing Design	2	2
Total		***4***	***4***
		14	***14***

D. PROJECT PREPARATION AND DESIGN

9. DESIGN THEORY AND METHODOLOGY

COURSE	*TITLE*	*CONTACT*	*CREDIT*
--	--	--	--
Total		***0***	***0***

10. DESIGN STUDIO

COURSE	*TITLE*	*CONTACT*	*CREDIT*
ARC 100	Design Studio I	12	6
ARC 202	Design Studio II	12	6
ARC 203	Design Studio III	12	6
ARC 304	Design Studio IV	12	6
ARC 305	Design Studio V	12	6
ARC 406	Design Studio VI	12	6
ARC 408	Senior Project	14	7
Total		***86***	***43***
		86	***43***

F. COMMUNICATION

15 WRITTEN AND ORAL

COURSE	TITLE	CONTACT	CREDIT
ENGL 001	Preparatory English I	20	8
ENGL 002	Preparatory English II	20	8
ENGL 101	English Composition I	3	3
ENGL 101	English Composition II	3	3
LAS 200	Introduction to Arabic Essay	2	2
ENGL 214	Technical Report Writing	3	3
LAS 300	Arabic Terminology	2	2
LAS 400	Arabic Syntax	2	2
Total		*55*	*31*

16. PRESENTATION TECHNIQUES

COURSE	TITLE	CONTACT	CREDIT
ME 001	Preparatory Shop and Graphics I	2	1
ME 002	Preparatory Shop II	2	1
ICS 101	Computer Programming	4	2
ARE 221	Computer Graphics	5	3
ARC 434	Perception, Geometry and Colour in Architecture	2	2
ARC 100	Graphics Communication	12	6
Total		*27*	*15*
		82	*46*

G. PROFESSIONAL PRACTICE AND MANAGEMENT

17. PROFESSIONAL PRACTICE

COURSE	TITLE	CONTACT	CREDIT
ARC 435	Professional Laws & Regulations	2	2
ARE 414	Contracts & Specifications	3	3
ARE 331	Building Economy	3	3
Total		*8*	*8*

18. CONSTRUCTION DOCUMENT

COURSE	TITLE	CONTACT	CREDIT
--	--	--	--
Total		*0*	*0*
		8	*8*

E COMPLEMENTARY STUDIES

13. ELECTIVE COURSES

COURSE	TITLE	CONTACT	CREDIT
ARC 3xx	Elective I	2	2
ARC 3xx	Elective II	2	2
ARC 4xx	Elective III	2	2
ARC 4xx	Elective IV	2	2
LAS xxx	Elective	2	2
Total		*10*	*10*

13. RESEARCH AND WRITTEN DISSERTATION

COURSE	*TITLE*	*CONTACT*	*CREDIT*
ARC 400	Senior Project Preparation	1	1
Total		***1***	***1***

11. OTHERS

COURSE	*TITLE*	*CONTACT*	*CREDIT*
CE260	Surveying I	5	3
ARC 300	Summer practical training	3	1
Total		***8***	***4***
		19	***15***

Total credit hours required in Degree Program: 183
Total contact hours required in Degree Program: 286

Umm Al-Qura University

College of Engineering and Islamic Architecture, Makkah

A. BASIC SUBJECTS

1. ISLAMIC STUDIES

COURSE	TITLE	CONTACT	CREDIT
0601-101	Islamic Studies I	2	2
0601-201	Islamic Studies II	2	2
0601-301	Islamic Studies III	3	3
0601-401	Islamic Studies IV	2	2
0605-101	Quran I	2	2
0605-201	Quran II	2	2
0605-301	Quran III	2	2
0605-401	Quran IV	2	2
0801-162	Islamic Science I	1	1
0801-261	Islamic Science II	1	1
0801-262	Islamic Science III	1	1
0801-361	Islamic Science IV	1	1
0801-481	Islamic Principles for Architecture	2	2
0201-112	The Prophet's Life	2	2
Total		*25*	*25*

2. BASIC SCIENCE

COURSE	TITLE	CONTACT	CREDIT
0801-111	Basic Science for Architects I	2	2
0801-131	Descriptive Geometry For Architects	4	2
0801-112	Basic Science for Architects II	2	2
Total		*8*	*6*

3. OTHERS

COURSE	TITLE	CONTACT	CREDIT
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Total		*0*	*0*
		33	*31*

B. BUILDING TECHNOLOGY

4. BUILDING CONSTRUCTION

COURSE	TITLE	CONTACT	CREDIT
0801-241	Building Construction I	2	2
0801-242	Building Construction II	2	2
0801-341	Building Construction III	2	2
0801-342	Building Construction IV	2	2
0801-172	Materials Property	1	1
0801-121	Workshop I	2	2
Total		*11*	*11*

5. *BUILDING SCIENCE*

COURSE	*TITLE*	*CONTACT*	*CREDIT*
0801-381	Building Science I	2	2
0801-382	Building Science II	2	2
Total		***4***	***4***

6. *STRUCTURE*

COURSE	*TITLE*	*CONTACT*	*CREDIT*
0803-225	Structure I	2	2
0803-226	Structure II	2	2
0803-325	Structure III	2	2
0803326	Structure IV	2	2
0801-425	Structure V	2	2
Total		***10***	***10***
		25	***25***

C. *SOCIAL STUDIES AND HUMANITIES*

7. *HISTORY AND THEORY*

COURSE	*TITLE*	*CONTACT*	*CREDIT*
0801-252	Theories of Architecture I	2	2
0801-351	Theories of Architecture II	2	2
0801-211	Architecture of Ancient Civilizations	2	2
0801-212	Islamic Architecture	2	2
0801-341	Contemporary Islamic Architecture	2	2
0801-482	Contemporary Built Environment	2	2
Total		***12***	***12***

8. *CONTEXT AND SURROUNDING*

COURSE	*TITLE*	*CONTACT*	*CREDIT*
0801-371	Urban Design I	2	2
0801-372	Urban Design II	2	2
0801-332	Housing	2	2
0801-442	Landscape Architecture	2	2
Total		***8***	***8***
		20	***20***

D. *PROJECT PREPARATION AND DESIGN*

9. *DESIGN THEORY AND METHODOLOGY*

COURSE	*TITLE*	*CONTACT*	*CREDIT*
0801-142	Design Process	1	1
0801-251	Theories of Architectural Design	1	1
0801-441	Design of Exterior Spaces	2	2
Total		***4***	***4***

10. DESIGN STUDIO

COURSE	TITLE	CONTACT	CREDIT
0801-101	Design Studio I	11	5
0801-102	Design Studio II	11	5
0801-201	Design Studio III	11	5
0801-202	Design Studio IV	11	5
0801-301	Design Studio V	11	5
0801-302	Design Studio VI	11	5
0801-401	Design Studio VII	11	5
0801-402	Design Studio VIII	14	6
0801-451	Design Studio IX	14	6
0801-452	Design Studio X	14	6
Total		*119*	*53*
		123	*57*

F. COMMUNICATION

15 WRITTEN AND ORAL

COURSE	TITLE	CONTACT	CREDIT
0705-101	English Language I	6	2
0705-102	English Language II	4	2
0705-103	English Language III	4	2
0501-101	Arabic Language	3	2
Total		*17*	*8*

16. PRESENTATION TECHNIQUES

COURSE	TITLE	CONTACT	CREDIT
0801-152	Perspective, Shade and shadow	2	2
0801-282	Introduction to Computing	2	2
0801-391	Computer Aided Drafting I	4	2
0801-392	Computer Aided Drafting II	4	2
0801-122	Workshop II	2	2
Total		*14*	*10*
		31	*18*

G. PROFESSIONAL PRACTICE AND MANAGEMENT

17. PROFESSIONAL PRACTICE

COURSE	TITLE	CONTACT	CREDIT
0801-461	Construction Management	2	2
0801-471	Building Economics	2	2
Total		*4*	*4*

18. CONSTRUCTION DOCUMENT

COURSE	TITLE	CONTACT	CREDIT
--	--	--	--
Total		*0*	*0*
		4	*4*

E COMPLEMENTARY STUDIES

13. ELECTIVE COURSES

COURSE	*TITLE*	*CONTACT*	*CREDIT*
--	--	--	--
Total		***0***	***0***

13. RESEARCH AND WRITTEN DISSERTATION

COURSE	*TITLE*	*CONTACT*	*CREDIT*
0801-271	Research Methodology	1	1
0801-491	Graduation Project	1	1
Total		***2***	***2***

11. OTHERS

COURSE	*TITLE*	*CONTACT*	*CREDIT*
0801-311	Surveying	4	2
0801-395	Summer Training I (Traditional Site Surveying)	--	2
0801-445	Summer Training II (Office Training)	--	2
0801-411	Design of Interior Spaces I	2	2
0801-412	Design of Interior Spaces II	2	2
Total		***8***	***10***
		10	***12***

Total credit hours required in Degree Program: 167
Total contact hours required in Degree Program: 246

APPENDIX VI

Psychology of Learning in the Context of Architectural Education

In view of the fact that there are recurring themes in the comments of the respondents interviewed by the researcher during his field trip which parallel motifs within the learning theories, it is helpful to look at the psychology of learning and its relation to the teaching of architecture. In particular some types of learning theory stress the assimilation and accommodation of new information into existing structures (or schemata), which themselves are capable of reform and reorganisation in the light of new input and which therefore stand in a symbiotic relationship to new information. This process appears to be analogous to the desired integration of subjects within the architecture curriculum, which so many interview respondents point out is lacking. There is great potential in this area for further research into the psychology of learning as it relates to architectural education.

Learning theories may be divided into two main groups: behaviourist (or behavioural) - primarily associated with B.F. Skinner (b. 1904) - and cognitivist (or cognitive). Behaviourist theories are mostly concerned with the outcome of learning as observable behaviour, and changes in performance, while cognitive theories are more concerned to establish models of the mental processes that are involved in learning. Cognitive theories are interested in studying the internal factors which facilitate learning, rather than external manipulations.

While behaviourism, which speaks in terms of stimuli and response, stresses visible results and cognitive theories concentrate on the processes involved in learning, there is no necessary contradiction between the two, since both are working models of the learning process rather than opposing candidates for a scientific consensus on the structure and operation of the mind. Indeed, many of the ideas developed within the setting of behavioural theory have been interpreted within the cognitive framework (as in Ausubel's 'reception learning' discussed below).

Jean Piaget (1896-1980) is the most significant educational psychologist espousing the cognitive approach. His most important contribution was to show that cognitive development may be understood as a series of qualitative changes in cognitive structure. Central to Piagetian thinking is the notion of the schema (plural schemata), which is an existing mental structure or compartment into which the mind organises information or data. Schemata are thought of as abstract structures which represent the knowledge stored in the memory. They are the existing mental structures that allow us to take in new information (Slavin, 1991). It is held by schema theorists that information that fits into a schema is more readily understood and assimilated than that which does not (Ausubel, 1968).

According to this model the learner's mind adapts to the environment through two key mechanisms, assimilation and accommodation. Assimilation is concerned with adapting and modifying information from the environment to fit with the learner's existing schemata; accommodation, on the other hand, consists of adapting and modifying schemata themselves to fit the new information. When a learner faces new information, he needs to assimilate this information into his existing schemata. If this information does not fit then, according to this theory, the learner needs to alter his schemata to accommodate the information (Fox, 1993). This process of accommodation, as well as assimilation, is a process in which the learner plays the decisive part (Good and Brophy, 1977). There is no suggestion, however, that this is all done at the conscious level; indeed it could hardly be so, and the process is largely automatic, such as the recognition of everyday objects.

Piaget and his notion of schemata have been associated within the field of educational theory with Bruner's 'discovery learning' (1966), which has gained a place as the most influential cognitive model of instruction; it may be contrasted with didactic instruction, which is the straightforward imparting of 'facts' to students, perhaps in a traditional classroom lecture. For Bruner the purpose of teaching is the development of the capacity to think rather than the mere absorbing of facts. It is not possible to learn all the facts that there are, but, argues Bruner, techniques and structures to handle knowledge in terms of understanding and synthesis can be acquired. Bruner envisages situations where discovery learning methods enable students to use *existing* knowledge in such a way that they will utilise it to solve new problems. Under a discovery learning approach, students will themselves seek alternatives and explanations rather than be taught solutions. Discovery learning means that students are more in control of the learning process than they would be under an expository system. The theory is that, having themselves discovered the knowledge or uncovered the solution, students will be able better both to structure what they have discovered, and to remember it. Of Bruner's contribution Slavin (1991) writes: 'Bruner argued that the teacher's role must be to create situations in which students can learn on their own, rather than to provide pre-packaged information.' (p. 192)

Discovery learning has, however, has met with some criticism on the grounds that it is not particularly efficient, being more time consuming than didactic instruction and no better at providing results. The main misgivings of critics seem to home in on the fact that there is, under a pure discovery learning approach, simply no built-in check that students are in fact learning the 'right' information. As Pressley (1995) acknowledges 'pure discovery sometimes produces less learning, less efficient learning, or less "correct" learning than educators might desire'. (p. 9)

A more productive approach might seem to be to acknowledge a spectrum of teaching approaches, at one end of which would be discovery learning and at the other end of which would be didactic instruction. It was, historically, a consideration of this approach that led to the proposal by Ausubel (1968) of the strategy of reception learning. Reception learning and the behavioural approach display some degree of similarity in their emphasis on teaching rather than in an interest in the cognitive processes of the student. However reception learning, like the cognitive model, places more stress on the structure and interconnections made by the students between the areas of knowledge that are needed for acquiring specific pieces of information. In other words, reception learning claims that successful instruction depends on teaching within structures that make sense to the recipients, building upon existing knowledge and making plain to the students that that is what is happening, which is consistent with Paiget's understanding of schemata.

This relates, in the context of architectural education in Saudi Arabia, to the remarks made by some of the respondents to the researcher's fieldwork interviews, particularly on the lack of integration of subjects and the failure to build upon existing knowledge. The teacher Ghamadi (interviewed 1998), for example, states:

> Within the Department structural subjects are taught separately from mechanical, electrical, and building science subjects, so that they do not integrate holistically, and this has negative results. . . During my period in Newcastle I noticed that all the subjects do feed into the studio, and that the students apply the knowledge they gain in the classroom to their work in the design studio. Students are asked to show that they have understood what they have been

> taught in the classroom, by writing reports or producing technical drawings relating to their studio work.

As we have noted, such a strategy implies that students have already, at least to some extent, acquired the techniques of problem-solving and the structures for understanding and synthesising new information. Students will already have gained, at least in part, the experience and the skills to assimilate new material and the cognitive structures to integrate it. Frameworks will already exist into which new facts can be fitted. Again, this is in line with what several fieldwork interview respondents have said about support subjects feeding into the design studio in architectural education. The teacher Ghamadi (interviewed 1998) comments:

> Structure should in fact be taught in the design studio, and when a student is asked to design a project the structural teacher should teach him how to design the specific structure of that project. In any architectural practice there is an integration between the design of a given project and its structural, mechanical, electrical, and plumbing aspects. In fact, however, these things are taught separately in classrooms, and they are not integrated in the design studio.

This is echoed by the teacher Haikal (interviewed 1998):

> The architecture curriculum in King Saud University is arranged such that the design studio is the centre of the curriculum, which all the other subjects should feed into. The design studio is where the student should learn how to think about architectural problems and how to handle them as an architect.

Where the student is able to reorganise or 'shift' the existing structures (or schemata) in order to assimilate new materials and objects of his own accord, then discovery learning can take place.

In the context of the discovery learning/didactic (expository) instruction continuum or spectrum, it is useful to compare the two strategies at opposite ends:

Expository (didactic) strategy:

- The teacher presents information in the form of a verbal explanation or a practical demonstration..

- The teachers checks for assimilation and understanding, and the information is repeated if necessary.
- Opportunities for practice are provided by the teacher, and the work is checked to ensure that the student has learned the principles involved.
- Opportunities are provided by the teacher for the nearly learned information to be applied in practical situations.

- Discovery strategy:
- Opportunities are provided by the teacher for students to act and perceive the consequences of what they do.
- The teacher confirms, through questions and observation, that students have grasped the cause and effect relationships involved. Further opportunities to act are offered if it is not clear that the relationships have been understood.
- Again through questioning the teacher seeks to confirm that general principles behind the action are grasped. If there is doubt, further cases are presented.
- Opportunities are provided by the teacher for the newly learned information to be applied in practical situations.

Between the two extremes of expository or didactic learning and discovery learning any point of the a continuum may be the locus of a teaching method. This continuum may be represented thus:

- Discovery:
- Pure discovery
- Free exploratory discovery (Bruner)
- Guided discovery (Gagne)
- Meaningful reception learning (Ausubel)
- Direct instruction (Becker, Engelmann)
- Expository (expositive, didactic)

The idea is that capable teachers can choose their teaching point to suit the student(s) they teach. At the discovery learning end of the spectrum or continuum there is learning that is independent of direct instruction, and at this continuum point the role of the teacher is simply to set up and supervise the activities of the learners. In such a situation the teacher does not give specific questions for the students to answer. Rather students are encouraged to develop knowledge in areas of particular interest to them and which are based on their previous knowledge.

At the opposite end of the spectrum is expository instruction (sometimes called expositive or didactic instruction). In such a situation the students are simply presented with the information directly, and traditional 'blackboard' teaching may be regarded as typical of such an instruction approach.

Between these two extremes may be found several other positions. One such is 'exploratory discovery' (Bruner), where learning goals are set in general terms and students are asked to look into a particular aspect in order to develop their learning skills. Gagne's 'guided discovery' technique is further towards direct instruction, and it is characterised by the setting of fixed objectives and more specific guidance for students in order that they might discover for themselves higher-order rules. Yet closer to the didactic approach is the 'meaningful reception learning' of Ausubel, where the teacher's relationship to the student is almost that of the direct instructor to the passive recipient. At this point in the spectrum greater guidance is given than in all steps except that of expository teaching.

Educationalists claim that effective teaching, and thus effective teachers, moves back and forth on this spectrum according to the demands of the situation, the skills and experience of the learners, and so on. It seems plain that, in the context of architectural education, some situations will suggest a teaching technique nearer to the pure didactic instruction end of the continuum - perhaps initial instruction in a support subject unfamiliar to students - and others will suggest a discovery approach - perhaps in the design studio where the aim should be to integrate information gained from other sources and apply it to design techniques.

In this context a distinction might be made between declarative and procedural knowledge (Gage and Berliner, 1991; Fox, 1993). According to Fox

> declarative knowledge is knowledge about facts: knowing something is so – for example that Australia is an island. Procedural knowledge, on the other hand, is knowing how to do something – for example, knowing how to solve a mathematics problem, or how to read. (Fox, 1993, p. 33)

Much education, including architectural education, has to be about the teaching of facts, declarative knowledge; but in the context of architectural education the provision of facts has to be combined with the deliverance of procedural information in order to make for efficient teaching. This is particularly true of architectural education because of its emphasis on design, which is in practice largely the process of designing. It is best taught through scenarios where design decisions have to made rather than through deductive and sequential explanations, though declarative knowledge can play a complementary role. A teaching approach that emphasises drawing upon existing knowledge and assimilating new information therefore suggests itself, and is in line with the claim of education theorists that both declarative and procedural knowledge are organised in networks of concepts or relationships, in fact in Paiget's schemata (Slavin, 1991).

This is where teaching approach and teaching technique is of vital importance. As pointed out by Gage & Berliner (1991), where a relevant schema does not exist, the teacher must provide it for the material he is teaching. When teachers can relate new material to what students already know, the students can generate their own meaning for the material, and assimilate and retrieve it more easily. The function of what Ausubel (1968) has called 'advance organisers' falls into this category.

Ausubel's advance organisers are 'devices to facilitate learning and retention [through making the information meaningful and familiar to learners]' (Good & Brophy, 1977, p. 164). The process of using advance organisers is explained by Gage & Berliner (1991), as follows:

> The instructor provides students with an advance organizer - a brief introduction about the way in which information that is going to be presented is structured. The advance organizer is like a set of general concepts that helps students organize the more specific material that follows. (p. 282)

This approach stems from the notion of meaningful learning as that which constitutes the assimilation of new information into the existing knowledge structure or schema.

The advance structured preview of the content, provided by the teacher, is assumed to activate prior knowledge (i.e. schemata) that would increase the likelihood that the learner would be able to understand new information by relating the new content to prior knowledge. In this sense, as Brooks & Dansereau (1987) note, 'the prior content knowledge of a learner, if it is meaningful knowledge, functions similarly to Ausubel's . . . advance organizer' (p. 136). Ausubel's concept of advance organisers seems to show great potential as a device to be used by teachers in, as it were, pre-activating students' organising schemata in teaching in architectural education (See Ausubel, 1960).

In this context of architectural education, since the architectural knowledge base is mainly concerned with the environment in its broad sense, the learners' reservoirs of environmental schemata play a decisive role in the process of encoding the information they are given. An architecture student, for instance, is more likely to assimilate and absorb a piece of information about, say, structural systems, if he already enjoys a prior experience and knowledge of structures, whether verbal or visual. It will mean that the new information is much more likely to strike a chord with the student's previous knowledge and thus be acquired successfully.

The value can thus be seen, and a basis in cognitive theory established, for teaching and learning approaches such as study trips, visual note taking habits, monographs, surveying, and other experiences of the kind that help broaden the range of environmental schemata and visual reservoirs of alternative design solutions. This point is reinforced by the comments of one of the students interviewed by the researcher, Zinaigeer (interviewed 1998), speaking about the variety of methods used by one of his most capable teachers:

> Dr. Mohammed Shalbi, who had thirty years' experience in teaching Structure to architecture students . . . used to link structure to architecture, how to choose the right structural system for a design. He used to take us on site visits to see how a structure is constructed. He used to use slides, videotapes, and models, to make the subject really clear in our minds.

The student Atiah (interviewed 1998) also has something to contribute on this:

> Education needs examples. The architect and his quality depend on what he sees not what he reads. I wish that the information we get

> in the courses was supported by audio-visual aids, or site visits, or models.

The students' abstract knowledge structures, their schemata, should be developed to accommodate to the widest range of examples and applications. Teachers should attempt to present a wide range of examples in which the students can see how new principles and techniques can be used (Gage & Berliner, 1991). Many of those examples can be placed in real-world settings. Ultimately much of what is learned in school must meet some criterion of usefulness or value in the world beyond the school walls – which is, architecturally speaking, in the world of profession and practice.

These cognitive notions of schemata and meaningful learning underlie a series of teaching strategies in which the learners' pre-existing knowledge is taken as central. As stated earlier, these strategies fall into a spectrum, from direct explanation to pure discovery. The representative strategies can be put in a hierarchy in terms of the learners' degree of contribution to learning process, the stages of lesser contribution first: direct explanation, guided participation, observational learning, guided discovery, scaffolding/apprenticeship, and discovery learning.

Guided participation, as Pressley (1995) acknowledges

> involves extensive, explicit teacher direction of student processing. Teachers cue students step by step about how they should accomplish a task... [with the assumption that] students will eventually internalize the steps they are cued to use if they go through them enough times. (p. 8)

Guided discovery teaching, towards the other side of the spectrum, as Pressley (1995) states

> is more explicit than pure discovery teaching, typically involving the teacher posing questions to students, questions intended to lead students to understand ways that a problem could be solved. The questions lead the students to 'discover' strategies. (p. 9).

'Scaffolded' instruction is a result of continuous and mutually responsive interactions between students and teachers, in contrast to direct explanation, where the flow of input is more one-way, from the teacher to the students (Pressley, 1995, p. 10).

At any rate, whatever strategy may be used in instruction, learning in a cognitive sphere is interpreted as construction of meaning by the learners themselves. Cognitive learning takes place 'when learners actively construct or *generate* meaning for themselves out of what is presented to them' (Gage & Berliner, 1991, p. 287) (Italics in original).

APPENDIX VII

PILOT STUDY QUESTIONNAIRES

Teachers Questionnaire

For Official Use

Serial Number: ☐☐☐

TEACHER QESTIONNAIER

Introduction:

The purpose of this questionnaire is to collect data for a Ph.D. research on architectural education in Saudi Arabia and its relation to practice. The research seeks to answer the following research questions: What is the magnitude of the gap? How does the gap manifest itself? Where do the causes of the gap lie? How can the problem of the gap be tackled?

General Information:

Q.1 Name of the University you are currently associated with
(Please tick one which is apply)

1. King Abdul-Aziz University ☐
2. King Fahad University ☐
3. King Faisal University ☐
4. King Saud University ☐
5. Umm Al-Qura University ☐

Q.2 Academic Position

1. Lecturer ☐
2. assistant professor ☐
3. associate professor ☐
4. full professor ☐
5. Other (please specify) ☐ ____________

Q.3 What is your nationality?

1. Saudi ☐
2. Egyptian ☐
3. Sudanese ☐
4. Turkish ☐
5. British ☐
6. American ☐
7. Other (please specify) ☐ ____________

Q.4 Where did you obtain your first professional degree from?

1. Saudi University ☐
2. Non-Saudi University ☐

Practical Training:

Q.5 What is the length of the practical training that your school require its students to completed before graduation in your school?

1. 1 month ☐
2. 2 months ☐
3. 3 months ☐
4. From 4 to 6 months ☐
5. More than 6 months ☐

Q.6 Do you think it is enough?

1. Yes ☐
2. No ☐
3. Don't know ☐
4. No response ☐

Why?

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Q.7 Based on your experience, what do you think the appropriate length of practical training for a students of architecture should be?

1. 1 month ☐
2. 2 months ☐
3. 3 months ☐
4. From 4 to 6 months ☐
5. From 7 to 9 Months ☐
6. From 10 to 12 months ☐
7. More than 12 months ☐

Q.8 The most common benefits of work experience to students of architecture are listed below. Could you please indicate the extent to which a students of architecture would benefit from each one below.

Benefits of Work Experience to Students of Architecture	To a great extent (4)	To some Extent (3)	Slightly (2)	Not at all (1)
- Developing Skills and knowledge relevant to practice				
- Increasing enthusiasm for work on the degree				
- Acquiring new skills and knowledge				
- Improving performance on degree				
- Developing knowledge and skills on design				
- Developing knowledge and skills on technology				
- Developing knowledge and skills on site construction				
- Helping to develop personality				
- Developing knowledge and skills on professional practice				
- Deciding on type of career				
Others (Please specify)				
- ____________				
- ____________				
- ____________				

Teaching Methods:

Q.9 Please consider the following groups of teaching methods. Could you please indicate the extent to which each one of the teaching activities below feature in your teaching method.

Teaching Activity	To a great extent (1)	To some Extent (2)	Slightly (3)	Not at all (4)
- Presentation (lecture / taught seminars)				
- Interactions (group discussions / group tutorials / students-led seminars)				
- Practical training (workshops / labs)				
- Site visits (construction sites / materials suppliers / factories)				
- Independent study (design project / open learning / individual projects / dissertations)				
- Collaborative (group projects / team assignments)				
- Live projects (projects assignments seeking solutions to real problems)				
- Work placement (extended contact with outside organisations				
others (Please specify)				
- ____________				
- ____________				
- ____________				

Q.10 The purpose of this question is to measure your opinion about the following statements. Could you please indicate the extent to which you agree or disagree with the following statements.

Statements	Strongly agree (5)	Agree (4)	Neither Agree Nor disagree (3)	disagree (2)	Strongly disagree (1)
- There is no integration between the design studio and other courses of the curriculum.					
- course content is too theoretical					
- Course delivery is too theoretical					
- The main focus of the design studio is on the formal aspects and final presentation					
- The design studio focuses on individual work at the expense of work load and collaborative effort.					
- Textbooks used in architectural teaching are not relevant to Saudi Arabia					
- Architectural education should undergo accreditation process with accreditation criteria set by both the profession and the schools					
- Teaching dose not cover local building materials and construction					

Please use the space below if you have any comments you would like to add pertaining to teaching methods.

____
____
____
____

Practice and School Interaction:

Q.11 Do you practice architecture beside teaching?

1. a. yes ☐
2. No ☐
3. No Response ☐

If *YES* why?

Q.12 Do you think a teacher of architecture should practice architecture beside teaching?
(Please tick one which apply)

1. a. yes ☐
2. No ☐
3. Don't Know ☐
4. No Response ☐

Why?

Q.13 To what extent do you think architectural education should undergo accreditation process with accreditation criteria set by both the profession and the schools?

1. To a great extent ☐
2. To some extent ☐
3. Slightly ☐
4. Not at all ☐

Why?

Q.14 The most common forms of practitioners involvement with architectural schools are listed below. For each of the activities, could you please indicate the extent to which you would like to see practitioners involved with your school.

Forms of practitioners involvement with architectural schools	**To a great extent (4)**	**To some Extent (3)**	**Slightly (2)**	**Not at all (1)**
- Teaching at the schools (design studio and other courses)				
- Assessing the performance of the students (juries and examination participation)				
- Curriculum development (contribution to the design and content of the curriculum)				
- providing work placement for students				
- Assisting with live projects or assignment seeking solutions to real problems facing employer				
- Financial assistance				
Others (Please specify)				
-				
-				
-				

Q.14 The most common forms of teachers involvement with architectural practice are listed below. For each of the activities, could you please indicate the extent to which you have been involved in this way.

Forms of Teachers involvement with Architectural Practice	**To a great extent (4)**	**To some Extent (3)**	**Slightly (2)**	**Not at all (1)**
- Practising architecture				
- Conducting research on architectural practice				
- Involvement in design competition's juries.				
- Contributing to the organisation and regulation of architectural practice.				
Others (Please specify)				
-				
-				
-				

Please use the space below if you have any comments pertaining to teacher involvement with architectural practice or practitioners involvement with the schools.

Curriculum Content and Structure

Q.15 From your experience, what do you think is the appropriate length for an architectural course of study?

1. Four years ☐
2. Five years ☐
3. Six years ☐
4. Seven years ☐
5. Don't know ☐
6. No response ☐

Q.16 Do you think that the length of your current programme is enough?

1. yes ☐
2. No ☐
3. Don't know ☐
4. No response ☐

Why?

Q.17 The purpose of this question is to determine the extent to which the current curriculum of your school addresses the services required to be performed by students upon graduation.
Based on your experience as a teacher in this school, could you please indicate the degree to which you think your students are prepared to perform each of the services below.
(Please tick one box across each one of the services below)

Services of Architectural Practice	**Adequately Prepared (5)**	**Prepared (4)**	**Neither Prepared nor Unprepared (3)**	**Slightly Prepared (2)**	**Not Prepared (1)**
Office Administration					
1. Office management					
2. Office finances					
3. Office marketing (Determination of scope, parameters schedule, and budget for marketing studies)					
4. Office documentation					
Project Administration					
5. Contract negotiation and formation					
6. Clients negotiation					
7. English language communication					
8. Report preparation					
9. Record-keeping (time/progress)					
10. Progress reports					
11. Direction off work of in-house personnel					
12. Direction of work of consultants					
13. Preparation and updating of project development schedule					
14. Preparation of written and graphic explanatory materials					
15. Obtainment of building permissions					
Programming					
16. Design objectives, limitations, and criteria					
17. Space requirements					
18. Space relations					
19. Flexibility and expandability					
20. Special equipment and Systems					
21. Site requirements					
22. Research of community attitudes					
Existing Facilities Survey					
23. Photographic survey					
24. Field measurements					
25. Review of existing design data					

Services of Architectural Practice	Adequately Prepared (5)	Prepared (4)	Neither Prepared nor Unprepared (3)	Slightly Prepared (2)	Not Prepared (1)
26. Analysis of existing structural capabilities					
27. Analysis of existing mechanical capabilities					
28. Analysis of existing electrical capabilities					
29. Development of measured drawings					
Economic Feasibility Studies					
30. Total project cost estimates					
31. Operation and maintenance costs					
32. Financing requirements					
33. Cash flow for design, construction, and operation					
34. Return on investment studies					
35. Equity requirements					
Project Financing					
36. Preparing and submitting data, supplementary drawings and documentation					
37. Research of financing availability					
38. Direct solicitation of financing sources					
Site analysis and Selection					
39. Identification of potential site(s)					
40. On-site analysis (soils, topography, vegetation views climate)					
41. Movement systems, traffic, and parking studies					
42. Analysis of deed, zoning, and other legal restrictions					
43. Analysis of transportation, housing, community facilities, and utilities					
44. Site analysis, evaluation, and comparisons					
Site Development Planning					
45. Land utilization					
46. Structures placement					
47. Form relationships					
48. Movement systems, circulation, and parking					
49. Utilities system					
50. surface and subsurface conditions					
51. Ecological requirements					
52. Deeds, zoning, and other legal restrictions					
53. Landscape concepts and forms					
54. Topography and relationship to surrounding areas					

Services of Architectural Practice	Adequately Prepared (5)	Prepared (4)	Neither Prepared nor Unprepared (3)	Slightly Prepared (2)	Not Prepared (1)
Space Schematics/flow diagrams					
55. Internal functions					
56. Human, vehicular, and material flow patterns					
57. Adjacency					
58. General space allocations					
59. Analysis of operating functions					
60. Flexibility and expandability					
61. Materials handling					
62. Special facilities and equipment					
63. Research of applicable building codes, laws and regulations					
64. Studies of construction market and materials, equipment, and labour					
Design					
65. Building plans and elevations					
66. Selection and layout of building systems and materials					
67. Site planning					
68. Structural considerations (structural components, materials, and systems)					
69. Mechanical considerations (energy conservation, plumbing, Fire protection)					
70. Electrical considerations (power service, lighting, telephone, fire and security systems)					
71. Civil considerations (utilities, fire protection, drainage, paving)					
72. landscape considerations (land forms, ground cover, paving, plant materials)					
73. Interior considerations (furnishings)					
74. Acoustics consideration					
75. Climatic consideration (passive)					
76. Climatic consideration (active)					
77. Lighting consideration (natural)					
78. Lighting consideration (artificial)					
79. Socio-cultural values consideration					
80. Budget and financial consideration					
81. Barrier free design for the handicapped					
82. Creativity and aesthetic consideration					
Presentations					
83. Preparation Architectural drawing and rendering (shade, shadows and perspective)					
84. Preparation of architectural models					
85. Preparation of written documents					
86. Client presentation and negotiation					
87. Agencies presentation and negotiation					

Services of Architectural Practice	Adequately Prepared (5)	Prepared (4)	Neither Prepared nor Unprepared (3)	Slightly Prepared (2)	Not Prepared (1)
88. Committees					
89. Appearances at meetings and hearings					
90. Computer aided designing and drafting					
construction Documents					
91. Architectural drawings					
92. Structural drawings					
93. Mechanical drawings					
94. Electrical drawings					
95. Civil drawings					
96. Landscape drawings					
97. Interior drawings					
98. Alternates					
99. Specifications					
100. Bidding documents					
Bidding/Negotiation					
101. Organising and handling bidding documents					
102. Assistance in bidding and negotiating process					
103. Analysis of alternate systems and materials					
104. Bid evaluation					
105. Preparation of construction contract					
Construction					
106. construction administration - office					
107. Construction administration - field					
108. Field testing					
109. Preparation of supplemental documents					
110. Preparation of quotation requests/change orders					
111. Construction cost accounting					
112. Site supervision					
Post-construction					
113. Assistance in establishment of operation and maintenance program					
114. Start-up assistance					
115. Record drawings services					
116. Warranty review					
117. I50. Post-construction evaluation					
118. Project close-out					
Special Services					
119. Renderings					

Services of Architectural Practice	Adequately Prepared (5)	Prepared (4)	Neither Prepared nor Unprepared (3)	Slightly Prepared (2)	Not Prepared (1)
120. life cycle cost and/or value analysis					
121. Energy studies and/or audits					
122. Tenant-related services					
123. Graphics design/brochures					
124. Fine arts and crafts services					
125. Special furnishings design					
126. Non-building equipment selection					
127. Project promotion/public relations					
128. Materials and systems testing					
129. Demolition services					
130. photographic services					
131. Model/mock-up services					
132. Building re-utilisation					
133. Building preservation					

Q.18 The purpose of this question is to determine the extent to which the curriculum of your school should address the services required to be performed by students upon graduation.
Based on your experience as a teacher of architecture, could you please indicate the degree of importance of each one of the services below you think the curriculum of your school should address in the future.
(Please tick one box across each one of the services below)

Services of Architectural Practice	Very Important (5)	Important (4)	Neither Important nor Unimportant (3)	Slightly Important (2)	Not Important (1)
Office Administration					
1. Office management					
2. Office finances					
3. Office marketing (Determination of scope, parameters schedule, and budget for marketing studies)					
4. Office documentation					
Project Administration					
5. Contract negotiation and formation					
6. Clients negotiation					
7. English language communication					
8. Report preparation					
9. Record-keeping (time/progress)					
10. Progress reports					
11. Direction off work of in-house personnel					
12. Direction of work of consultants					

Services of Architectural Practice	Very Important (5)	Important (4)	Neither Important nor Unimportant (3)	Slightly Important (2)	Not Important (1)
13. Preparation and updating of project development schedule					
14. Preparation of written and graphic explanatory materials					
15. Obtainment of building permissions					
Programming					
16. Design objectives, limitations, and criteria					
17. Space requirements					
18. Space relations					
19. Flexibility and expandability					
20. Special equipment and Systems					
21. Site requirements					
22. Research of community attitudes					
Existing Facilities Survey					
23. Photographic survey					
24. Field measurements					
25. Review of existing design data					
26. Analysis of existing structural capabilities					
27. Analysis of existing mechanical capabilities					
28. Analysis of existing electrical capabilities					
29. Development of measured drawings					
Economic Feasibility Studies					
30. Total project cost estimates					
31. Operation and maintenance costs					
32. Financing requirements					
33. Cash flow for design, construction, and operation					
34. Return on investment studies					
35. Equity requirements					
Project Financing					
36. Preparing and submitting data, supplementary drawings and documentation					
37. Research of financing availability					
38. Direct solicitation of financing sources					
Site analysis and Selection					
39. Identification of potential site(s)					

Services of Architectural Practice	Very Important (5)	Important (4)	Neither Important nor Unimportant (3)	Slightly Important (2)	Not Important (1)
40. On-site analysis (soils, topography, vegetation views climate)					
41. Movement systems, traffic, and parking studies					
42. Analysis of deed, zoning, and other legal restrictions					
43. Analysis of transportation, housing, community facilities, and utilities					
44. Site analysis, evaluation, and comparisons					
Site Development Planning					
45. Land utilization					
46. Structures placement					
47. Form relationships					
48. Movement systems, circulation, and parking					
49. Utilities system					
50. surface and subsurface conditions					
51. Ecological requirements					
52. Deeds, zoning, and other legal restrictions					
53. Landscape concepts and forms					
54. Topography and relationship to surrounding areas					
Space Schematics/flow diagrams					
55. Internal functions					
56. Human, vehicular, and material flow patterns					
57. Adjacency					
58. General space allocations					
59. Analysis of operating functions					
60. Flexibility and expandability					
61. Materials handling					
62. Special facilities and equipment					
63. Research of applicable building codes, laws and regulations					
64. Studies of construction market and materials, equipment, and labour					
Design					
65. Building plans and elevations					
66. Selection and layout of building systems and materials					
67. Site planning					
68. Structural considerations (structural components, materials, and systems)					
69. Mechanical considerations (energy conservation, plumbing, Fire protection)					

Services of Architectural Practice	Very Important (5)	Important (4)	Neither Important nor Unimportant (3)	Slightly Important (2)	Not Important (1)
70. Electrical considerations (power service, lighting, telephone, fire and security systems)					
71. Civil considerations (utilities, fire protection, drainage, paving)					
72. landscape considerations (land forms, ground cover, paving, plant materials)					
73. Interior considerations (furnishings)					
74. Acoustics consideration					
75. Climatic consideration (passive)					
76. Climatic consideration (active)					
77. Lighting consideration (natural)					
78. Lighting consideration (artificial)					
79. Socio-cultural values consideration					
80. Budget and financial consideration					
81. Barrier free design for the handicapped					
82. Creativity and aesthetic consideration					
Presentations					
83. Preparation Architectural drawing and rendering (shade, shadows and perspective)					
84. Preparation of architectural models					
85. Preparation of written documents					
86. Client presentation and negotiation					
87. Agencies presentation and negotiation					
88. Committees					
89. Appearances at meetings and hearings					
90. Computer aided designing and drafting					
construction Documents					
91. Architectural drawings					
92. Structural drawings					
93. Mechanical drawings					
94. Electrical drawings					
95. Civil drawings					
96. Landscape drawings					
97. Interior drawings					
98. Alternates					
99. Specifications					
100. Bidding documents					

Services of Architectural Practice	Very Important (5)	Important (4)	Neither Important nor Unimportant (3)	Slightly Important (2)	Not Important (1)
Bidding/Negotiation					
101. Organising and handling bidding documents					
102. Assistance in bidding and negotiating process					
103. Analysis of alternate systems and materials					
104. Bid evaluation					
105. Preparation of construction contract					
Construction					
106. construction administration - office					
107. Construction administration - field					
108. Field testing					
109. Preparation of supplemental documents					
110. Preparation of quotation requests/change orders					
111. Construction cost accounting					
112. Site supervision					
Post-construction					
113. Assistance in establishment of operation and maintenance program					
114. Start-up assistance					
115. Record drawings services					
116. Warranty review					
117. Post-construction evaluation					
118. Project close-out					
Special Services					
119. Renderings					
120. life cycle cost and/or value analysis					
121. Energy studies and/or audits					
122. Tenant-related services					
123. Graphics design/brochures					
124. Fine arts and crafts services					
125. Special furnishings design					
126. Non-building equipment selection					
127. Project promotion/public relations					
128. Materials and systems testing					
129. Demolition services					
130. photographic services					
131. Model/mock-up services					
132. building re-utilisation					
133. Building preservation					

<u>Students Questionnaire</u>

For Official Use

Serial Number: ☐☐☐

STUDENT QESTIONNAIER

Introduction:

The purpose of this questionnaire is to collect data for a Ph.D. research on architectural education in Saudi Arabia and its relation to practice. The research seeks to answer the following research questions: What is the magnitude of the gap? How does the gap manifest itself? Where do the causes of the gap lie? How can the problem of the gap be tackled?

General Information:

Q.1 What is the name of your university:
(Please tick one which is apply)

1. King Abdul-Aziz University ☐
2. King Fahad University ☐
3. King Faisal University ☐
4. King Saud University ☐
5. Umm Al-Qura University ☐

Q.2 What is you GPA?
(Please tick one which is apply)

1. 4.0 - 4.99 ☐
2. 3.0 - 3.99 ☐
3. 2.0 - 2.99 ☐
4. 1.0 - 1.99 ☐

Q.3 What is your academic level?
(Please tick one which is apply)

1. Fifth level ☐
2. Fourth level ☐

Practical Training:

Q.4 Have you finished you practical training that was part of your graduation requirement?
(Please tick one which is apply)

1. Yes ☐
2. No ☐

Q.5 How long have you had in total?

1. 1 month ☐
2. 2 months ☐
3. 3 months ☐
4. From 4 to 6 months ☐
5. More than 6 months ☐

Q.6 where have you had your practical training?

1. architectural office ☐
2. constrictor's office ☐
3. Government agency ☐
4. other (please specify) ☐ ____________________

Q.7 Have you had any practical training outside the school that was not part of your graduation requirement?

1. yes ☐
2. No ☐
3. No response ☐

Q.8: How long have you had in total?

1. 1 month ☐
2. 2 months ☐
3. 3 months ☐
4. From 4 to 6 months ☐
5. From 7 to 9 Months ☐
6. From 10 to 12 months ☐
7. More than 12 months ☐

Q.9 where have you had your practical training?

1. architectural office ☐
2. constrictor's office ☐
3. Government agency ☐
4. Other (please specify) ☐ ____________________

Q.10 Based on your experience as a student of architecture, what do you think the appropriate length of practical training for a students of architecture should be?

1. 1 month ☐
2. 2 months ☐
3. 3 months ☐

4. From 4 to 6 months ☐
5. From 7 to 9 Months ☐
6. From 10 to 12 months ☐
7. More than 12 months ☐

Q.11 Do you think the length of the practical training you have had as part of your graduation requirement was enough?

1. Yes ☐
2. No ☐
3. Don't know ☐
4. No response ☐

Why?

____
____
____
____
____
____

Q.12 The most common benefits of work experience to students of architecture are listed below. Could you please indicate the extent to which a student of architecture would benefit from each one below.

Benefits of Work Experience to Students of Architecture	To a great extent (4)	To some Extent (3)	Slightly (2)	Not at all (1)
- Developing Skills and knowledge relevant to practice				
- Increasing enthusiasm for work on the degree				
- Acquiring new skills and knowledge				
- Improving performance on degree				
- Developing knowledge and skills on design				
- Developing knowledge and skills on technology				
- Developing knowledge and skills on site construction				
- Helping to develop personality				
- Developing knowledge and skills on professional practice				
- Deciding on type of career				
Others (Please specify)				
- ____________				
- ____________				
- ____________				

Please use the space below if you have any comments you would like to add about your practical training.

____
____
____
____
____
____
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Teaching Methods:

Q.13 Please consider the following groups of teaching methods. Could you please indicate the extent to which each of the teaching activities below feature in your current course of study.

Teaching Methods	To a great extent (4)	To some Extent (3)	Slightly (2)	Not at all (1)
Presentation (lecture / taught seminars)				
Interactions (group discussions / group tutorials / students-led seminars)				
Practical training (workshops / labs)				
Site visits (construction sites / materials suppliers / factories)				
Independent study (design project / open learning / individual projects / dissertations)				
Collaborative (group projects / team assignments)				
Live projects (projects assignments seeking solutions to real problems)				
Work placement (extended contact with outside organisations)				
Others (Please specify)				
- ____________				
- ____________				
- ____________				

Q.14 The purpose of this question is to measure your opinion about the following statements. Could you please indicate the extent to which you agree or disagree with the following statements.

Statements	Strongly agree (5)	Agree (4)	Neither Agree Nor disagree (3)	disagree (2)	Strongly disagree (1)
- There is no integration between the design studio and other courses of the curriculum.					
- Work load on students is too heavy					
- Course content is too theoretical					
- Course delivery is too theoretical					
- The main focus of the design studio is on the formal aspects and final presentation					
- The design studio focuses on individual work at the expense of work load and collaborative effort.					
- Textbooks used in architectural teaching are not relevant to Saudi Arabia					
- Teaching dose not cover local building materials and construction					

Practice and School Interaction:

Q.15 The most common forms of practitioners involvement with architectural schools are listed below. For each of the activities , could you please indicate the extent to which you would like to see practitioners involved with your school.

Forms of practitioners involvement with architectural schools	To a great extent (4)	To some Extent (3)	Slightly (2)	Not at all (1)
- Teaching at the schools				
- Assessing the performance of the students (juries and examination participation)				
- Contribution to the design and content of the curriculum				
- providing work placement for students				
- Assisting with live projects or assignment seeking solutions to real problems facing employer				
- Financial assistance				
Others (Please specify)				
- __________				
- __________				
- __________				

Q.16 The most common forms of teachers involvement with architectural practice are listed below. For each of the activities, could you please indicate the extent to which you would like to see your teachers involved with practice.

Forms of Teachers involvement with Architectural Practice	To a great extent (4)	To some Extent (3)	Slightly (2)	Not at all (1)
- Practising architecture				
- Conducting research on architectural practice				
- Involvement in design competition's juries.				
- Contributing to the organisation and regulation of architectural practice				
Others (Please specify)				
- __________				
- __________				
- __________				

Curriculum Content:

Q.17 The purpose of this question is to determine the extent to which the current curriculum of f your school addresses the services required to be performed by students upon graduation.
Based on your experience as a student of this school, could you please indicate the degree to which you think you are prepared by your school to perform each of the services below.
(Please tick one box across each one of the services below)

Services of Architectural Practice	Adequately Prepared (5)	Prepared (4)	Neither Prepared nor Unprepared (3)	Slightly Prepared (2)	Not Prepared (1)
Office Administration					
1. Office management					
2. Office finances					
3. Office marketing (Determination of scope, parameters schedule, and budget for marketing studies)					
4. Office documentation					
Project Administration					
5. Contract negotiation and formation					
6. Clients negotiation					
7. English language communication					
8. Report preparation					
9. Record-keeping (time/progress)					

Services of Architectural Practice	Adequately Prepared (5)	Prepared (4)	Neither Prepared nor Unprepared (3)	Slightly Prepared (2)	Not Prepared (1)
10. Progress reports					
11. Direction off work of in-house personnel					
12. Direction of work of consultants					
13. Preparation and updating of project development schedule					
14. Preparation of written and graphic explanatory materials					
15. Obtainment of building permissions					
Programming					
16. Design objectives, limitations, and criteria					
17. Space requirements					
18. Space relations					
19. Flexibility and expandability					
20. Special equipment and Systems					
21. Site requirements					
22. Research of community attitudes					
Existing Facilities Survey					
23. Photographic survey					
24. Field measurements					
25. Review of existing design data					
26. Analysis of existing structural capabilities					
27. Analysis of existing mechanical capabilities					
28. Analysis of existing electrical capabilities					
29. Development of measured drawings					
Economic Feasibility Studies					
30. Total project cost estimates					
31. Operation and maintenance costs					
32. Financing requirements					
33. Cash flow for design, construction, and operation					
34. Return on investment studies					
35. Equity requirements					
Project Financing					
36. Preparing and submitting data, supplementary drawings and documentation					
37. Research of financing availability					
38. Direct solicitation of financing sources					

Services of Architectural Practice	Adequately Prepared (5)	Prepared (4)	Neither Prepared nor Unprepared (3)	Slightly Prepared (2)	Not Prepared (1)
Site analysis and Selection					
39. Identification of potential site(s)					
40. On-site analysis (soils, topography, vegetation views climate)					
41. Movement systems, traffic, and parking studies					
42. Analysis of deed, zoning, and other legal restrictions					
43. Analysis of transportation, housing, community facilities, and utilities					
44. Site analysis, evaluation, and comparisons					
Site Development Planning					
45. Land utilization					
46. Structures placement					
47. Form relationships					
48. Movement systems, circulation, and parking					
49. Utilities system					
50. surface and subsurface conditions					
51. Ecological requirements					
52. Deeds, zoning, and other legal restrictions					
53. Landscape concepts and forms					
54. Topography and relationship to surrounding areas					
Space Schematics/flow diagrams					
55. Internal functions					
56. Human, vehicular, and material flow patterns					
57. Adjacency					
58. General space allocations					
59. Analysis of operating functions					
60. Flexibility and expandability					
61. Materials handling					
62. Special facilities and equipment					
63. Research of applicable building codes, laws and regulations					
64. Studies of construction market and materials, equipment, and labour					
Design					
65. Building plans and elevations					
66. Selection and layout of building systems and materials					
67. Site planning					
68. Structural considerations (structural components, materials, and systems)					

Services of Architectural Practice	Adequately Prepared (5)	Prepared (4)	Neither Prepared nor Unprepared (3)	Slightly Prepared (2)	Not Prepared (1)
69. Mechanical considerations (energy conservation, plumbing, Fire protection)					
70. Electrical considerations (power service, lighting, telephone, fire and security systems)					
71. Civil considerations (utilities, fire protection, drainage, paving)					
72. landscape considerations (land forms, ground cover, paving, plant materials)					
73. Interior considerations (furnishings)					
74. Acoustics consideration					
75. Climatic consideration (passive)					
76. Climatic consideration (active)					
77. Lighting consideration (natural)					
78. Lighting consideration (artificial)					
79. Socio-cultural values consideration					
80. Budget and financial consideration					
81. Barrier free design for the handicapped					
82. Creativity and aesthetic consideration					
Presentations					
83. Preparation Architectural drawing and rendering (shade, shadows and perspective)					
84. Preparation of architectural models					
85. Preparation of written documents					
86. Client presentation and negotiation					
87. Agencies presentation and negotiation					
88. Committees					
89. Appearances at meetings and hearings					
90. Computer aided designing and drafting					
construction Documents					
91. Architectural drawings					
92. Structural drawings					
93. Mechanical drawings					
94. Electrical drawings					
95. Civil drawings					
96. Landscape drawings					
97. Interior drawings					
98. Alternates					

Services of Architectural Practice	Adequately Prepared (5)	Prepared (4)	Neither Prepared nor Unprepared (3)	Slightly Prepared (2)	Not Prepared (1)
99. Specifications					
100. Bidding documents					
Bidding/Negotiation					
101. Organising and handling bidding documents					
102. Assistance in bidding and negotiating process					
103. Analysis of alternate systems and materials					
104. Bid evaluation					
105. Preparation of construction contract					
Construction					
106. construction administration - office					
107. Construction administration - field					
108. Field testing					
109. Preparation of supplemental documents					
110. Preparation of quotation requests/change orders					
111. Construction cost accounting					
112. Site supervision					
Post-construction					
113. Assistance in establishment of operation and maintenance program					
114. Start-up assistance					
115. Record drawings services					
116. Warranty review					
117. 150. Post-construction evaluation					
118. Project close-out					
Special Services					
119. Renderings					
120. life cycle cost and/or value analysis					
121. Energy studies and/or audits					
122. Tenant-related services					
123. Graphics design/brochures					
124. Fine arts and crafts services					
125. Special furnishings design					
126. Non-building equipment selection					
127. Project promotion/public relations					
128. Materials and systems testing					
129. Demolition services					
130. photographic services					
131. Model/mock-up services					
132. Building re-utilisation					
133. Building preservation					

Q.18 The purpose of this question is to determine the extent to which the curriculum of your school should address the services required to be performed by students upon graduation.
Based on your experience as a student of architecture, could you please indicate the degree of importance of each one of the services below you think the curriculum of your school should address in the future.
(Please tick one box across each one of the services below)

Services of Architectural Practice	Very Important (5)	Important (4)	Neither Important nor Unimportant (3)	Slightly Important (2)	Not Important (1)
Office Administration					
1. Office management					
2. Office finances					
3. Office marketing (Determination of scope, parameters schedule, and budget for marketing studies)					
4. Office documentation					
Project Administration					
5. Contract negotiation and formation					
6. Clients negotiation					
7. English language communication					
8. Report preparation					
9. Record-keeping (time/progress)					
10. Progress reports					
11. Direction off work of in-house personnel					
12. Direction of work of consultants					
13. Preparation and updating of project development schedule					
14. Preparation of written and graphic explanatory materials					
15. Obtainment of building permissions					
Programming					
16. Design objectives, limitations, and criteria					
17. Space requirements					
18. Space relations					
19. Flexibility and expandability					
20. Special equipment and Systems					
21. Site requirements					
22. Research of community attitudes					
Existing Facilities Survey					
23. Photographic survey					
24. Field measurements					

Services of Architectural Practice	Very Important (5)	Important (4)	Neither Important nor Unimportant (3)	Slightly Important (2)	Not Important (1)
25. Review of existing design data					
26. Analysis of existing structural capabilities					
27. Analysis of existing mechanical capabilities					
28. Analysis of existing electrical capabilities					
29. Development of measured drawings					
Economic Feasibility Studies					
30. Total project cost estimates					
31. Operation and maintenance costs					
32. Financing requirements					
33. Cash flow for design, construction, and operation					
34. Return on investment studies					
35. Equity requirements					
Project Financing					
36. Preparing and submitting data, supplementary drawings and documentation					
37. Research of financing availability					
38. Direct solicitation of financing sources					
Site analysis and Selection					
39. Identification of potential site(s)					
40. On-site analysis (soils, topography, vegetation views climate)					
41. Movement systems, traffic, and parking studies					
42. Analysis of deed, zoning, and other legal restrictions					
43. Analysis of transportation, housing, community facilities, and utilities					
44. Site analysis, evaluation, and comparisons					
Site Development Planning					
45. Land utilization					
46. Structures placement					
47. Form relationships					
48. Movement systems, circulation, and parking					
49. Utilities system					
50. surface and subsurface conditions					
51. Ecological requirements					
52. Deeds, zoning, and other legal restrictions					

Services of Architectural Practice	Very Important (5)	Important (4)	Neither Important nor Unimportant (3)	Slightly Important (2)	Not Important (1)
53. Landscape concepts and forms					
54. Topography and relationship to surrounding areas					
Space Schematics/flow diagrams					
55. Internal functions					
56. Human, vehicular, and material flow patterns					
57. Adjacency					
58. General space allocations					
59. Analysis of operating functions					
60. Flexibility and expandability					
61. Materials handling					
62. Special facilities and equipment					
63. Research of applicable building codes, laws and regulations					
64. Studies of construction market and materials, equipment, and labour					
Design					
65. Building plans and elevations					
66. Selection and layout of building systems and materials					
67. Site planning					
68. Structural considerations (structural components. materials, and systems)					
69. Mechanical considerations (energy conservation, plumbing, Fire protection)					
70. Electrical considerations (power service. lighting, telephone, fire and security systems)					
71. Civil considerations (utilities, fire protection, drainage, paving)					
72. landscape considerations (land forms, ground cover, paving, plant materials)					
73. Interior considerations (furnishings)					
74. Acoustics consideration					
75. Climatic consideration (passive)					
76. Climatic consideration (active)					
77. Lighting consideration (natural)					
78. Lighting consideration (artificial)					
79. Socio-cultural values consideration					
80. Budget and financial consideration					
81. Barrier free design for the handicapped					
82. Creativity and aesthetic consideration					
Presentations					

Services of Architectural Practice	Very Important (5)	Important (4)	Neither Important nor Unimportant (3)	Slightly Important (2)	Not Important (1)
83. Preparation Architectural drawing and rendering (shade, shadows and perspective)					
84. Preparation of architectural models					
85. Preparation of written documents					
86. Client presentation and negotiation					
87. Agencies presentation and negotiation					
88. Committees					
89. Appearances at meetings and hearings					
90. Computer aided designing and drafting					
construction Documents					
91. Architectural drawings					
92. Structural drawings					
93. Mechanical drawings					
94. Electrical drawings					
95. Civil drawings					
96. Landscape drawings					
97. Interior drawings					
98. Alternates					
99. Specifications					
100. Bidding documents					
Bidding/Negotiation					
101. Organising and handling bidding documents					
102. Assistance in bidding and negotiating process					
103. Analysis of alternate systems and materials					
104. Bid evaluation					
105. Preparation of construction contract					
Construction					
106. construction administration - office					
107. Construction administration - field					
108. Field testing					
109. Preparation of supplemental documents					
110. Preparation of quotation requests/change orders					
111. Construction cost accounting					

Services of Architectural Practice	Very Important (5)	Important (4)	Neither Important nor Unimportant (3)	Slightly Important (2)	Not Important (1)
112. Site supervision					
Post construction					
113. Assistance in establishment of operation and maintenance program					
114. Start-up assistance					
115. Record drawings services					
116. Warranty review					
117. Post-construction evaluation					
118. Project close-out					
Special Services					
119. Renderings					
120. life cycle cost and/or value analysis					
121. Energy studies and/or audits					
122. Tenant-related services					
123. Graphics design/brochures					
124. Fine arts and crafts services					
125. Special furnishings design					
126. Non-building equipment selection					
127. Project promotion/public relations					
128. Materials and systems testing					
129. Demolition services					
130. photographic services					
131. Model/mock-up services					
132. building re-utilisation					
133. Building preservation					

Practitioners Questionnaire

For Official Use

Serial Number:

☐☐☐

PRACTITIONER QESTIONNAIER

Introduction:

The purpose of this questionnaire is to collect data for a Ph.D. research on architectural education in Saudi Arabia and its relation to practice. The research seeks to answer the following research questions: What is the magnitude of the gap? How does the gap manifest itself? Where do the causes of the gap lie? How can the problem of the gap be tackled?

General Information:

Q.1 What is your occupational sector?
(Please tick all that is applicable)

1. Government ☐
2. Private ☐
3. Other (Please specify) ☐ ____________

Q.2 How long have you been in practice?

1. Less than two years ☐
2. From 3 to 5 Years ☐
3. From 6 to 8 Year ☐
4. From 8 to 10 years ☐
5. From 11 to 15 years ☐
6. More than 15 Years ☐

Q.3 What is the nature of you practice?

1. Design ☐
2. Construction ☐
3. Management ☐
4. Other (Please specify) ☐ ____________

Q.4 Where did you obtain your first professional degree from?

1. Saudi University ☐
2. Non-Saudi University ☐

Q.5 What is your nationality

1. Saudi ☐
2. Egyptian ☐
3. Other (please specify) ☐ ____________

Practical Training:

Q.6 The most common benefits of work experience to students of architecture are listed below. Could you please indicate the extent to which a students of architecture would benefit from each one below.

Benefits of Work Experience to Students of Architecture	To a great extent (4)	To some Extent (3)	Slightly (2)	Not at all (1)
- Developing Skills and knowledge relevant to practice				
- Increasing enthusiasm for work on the degree				
- Acquiring new skills and knowledge				
- Improving performance on degree				
- Developing knowledge and skills on design				
- Developing knowledge and skills on technology				
- Developing knowledge and skills on site construction				
- Helping to develop personality				
- Developing knowledge and skills on professional practice				
- Deciding on type of career				
Others (Please specify)				
- ____________				
- ____________				
- ____________				

Q.7 From your experience, what do you think is the appropriate length of practical training for a students of architecture should be?

1. 1 month ☐
2. 2 months ☐
3. 3 months ☐
4. From 4 to 6 months ☐
5. From 7 to 9 Months ☐
6. From 10 to 12 months ☐
7. More than 12 months ☐

Why?

____

Teaching Methods:

Q.8 Please consider the following groups of teaching methods. Could you please indicate the extent to which each one of the teaching activities below you would like to see in schools of architecture in Saudi Arabia.

Teaching methods	To a great extent (1)	To some Extent (2)	Slightly (3)	Not at all (4)
- Presentation (lecture / taught seminars)				
- Interactions (group discussions / group tutorials / students-led seminars)				
- Practical training (workshops / labs)				
- Site visits (construction sites / materials suppliers / factories)				
- Independent study (design project / open learning / individual projects / dissertations)				
- Collaborative (group projects / team assignments)				
- Live projects (projects assignments seeking solutions to real problems)				
- Work placement (extended contact with outside organisations				
Others (Please specify)				
- ____________				
- ____________				
- ____________				

Q.9 The purpose of this question is to measure your opinion about the following statements. Could you please indicate the extent to which you agree or disagree with the following statements.

Statements	Strongly agree (5)	Agree (4)	Neither Agree Nor disagree (3)	disagree (2)	Strongly disagree (1)
- There is no integration between the design studio and other courses of the curriculum.					
- Work load on students is too heavy					
- Course content is too theoretical					

Statements	Strongly agree (5)	Agree (4)	Neither Agree Nor disagree (3)	disagree (2)	Strongly disagree (1)
- Course delivery is too theoretical					
- The main focus of the design studio is on the formal aspects and final presentation					
- The design studio focuses on individual work at the expense of work load and collaborative effort.					
- Textbooks used in architectural teaching are not relevant to Saudi Arabia					
- Teaching dose not cover local building materials and construction					

Practice and School Interaction:

Q.10 Do you teach architecture beside practising?

1. Yes ☐
2. No ☐

If *YES* why?

____

Q.11 Do you think a teacher of architecture should practice architecture beside teaching?

1. yes ☐
2. No ☐
3. Don't Know ☐
4. No Response ☐

If *YES* why?

____

Q.12 To what extent do you think architectural education should undergo accreditation process with accreditation criteria set by both the profession and the schools?

1. To a great extent ☐
2. To some extent ☐
3. Slightly ☐
4. Not at all ☐

Why?

Q.13 The most common forms of practitioners involvement with architectural schools are listed below. For each of the activities, could you please indicate the extent to which you have been involved in this way

Forms of Practitioners Involvement with Architectural Schools	To a great extent (4)	To some Extent (3)	Slightly (2)	Not at all (1)
- Teaching at the schools				
- Assessing the performance of the students (juries and examination participation)				
- Contribution to the design and content of the curriculum				
- providing work placement for students				
- Assisting with live projects or assignment seeking solutions to real problems facing employer				
- Financial assistance				
Others (Please specify)				
-				
-				
-				

Q.14 The most common forms of teachers involvement with architectural practice are listed below. For each of the activities, could you please indicate the extent to which you would like see teachers of architecture involve with architectural practice.

Forms of Teachers Involvement with Architectural Practice	To a great extent (4)	To some Extent (3)	Slightly (2)	Not at all (1)
- Practising architecture				
- Conducting research on architectural practice				
- Involvement in design competition's juries.				
- Contributing to the organisation and regulation of architectural practice.				
Others (Please specify)				
-				
-				
-				

Curriculum Content and Structure

Q.15 From your experience, what do you think is the appropriate length for an architectural course of study?

1. Four years ☐
2. Five years ☐
3. Six years ☐
4. Seven years ☐
5. Don't know ☐
6. No response ☐

Why?

Q.16 The purpose of this question is to determine the extent to which the current curriculum of the school of architecture in Saudi Arabia addresses the services required to be performed by students upon graduation.
Based on your own experience or your experience as an employer of newly graduated architects, could you please indicate the degree to which you think schools of architecture has prepared their students to perform each of the services below.
(Please tick one box across each one of the services below)

Services of Architectural Practice	Adequately Prepared (5)	Prepared (4)	Neither Prepared nor Unprepared (3)	Slightly Prepared (2)	Not Prepared (1)
Office Administration					
1. Office management					
2. Office finances					
3. Office marketing (Determination of scope, parameters schedule, and budget for marketing studies)					
4. Office documentation					
Project Administration					
5. Contract negotiation and formation					
6. Clients negotiation					
7. English language communication					
8. Report preparation					
9. Record-keeping (time/progress)					
10. Progress reports					
11. Direction off work of in-house personnel					
12. Direction of work of consultants					
13. Preparation and updating of project development schedule					
14. Preparation of written and graphic explanatory materials					
15. Obtainment of building permissions					
Programming					
16. Design objectives, limitations, and criteria					
17. Space requirements					
18. Space relations					
19. Flexibility and expandability					
20. Special equipment and Systems					
21. Site requirements					
22. Research of community attitudes					
Existing Facilities Survey					
23. Photographic survey					
24. Field measurements					
25. Review of existing design data					

Services of Architectural Practice	Adequately Prepared (5)	Prepared (4)	Neither Prepared nor Unprepared (3)	Slightly Prepared (2)	Not Prepared (1)
26. Analysis of existing structural capabilities					
27. Analysis of existing mechanical capabilities					
28. Analysis of existing electrical capabilities					
29. Development of measured drawings					
Economic Feasibility Studies					
30. Total project cost estimates					
31. Operation and maintenance costs					
32. Financing requirements					
33. Cash flow for design, construction, and operation					
34. Return on investment studies					
35. Equity requirements					
Project Financing					
36. Preparing and submitting data, supplementary drawings, and documentation					
37. Research of financing availability					
38. Direct solicitation of financing sources					
Site analysis and Selection					
39. Identification of potential site(s)					
40. On-site analysis (soils, topography, vegetation views climate)					
41. Movement systems, traffic, and parking studies					
42. Analysis of deed, zoning, and other legal restrictions					
43. Analysis of transportation, housing, community facilities, and utilities					
44. Site analysis, evaluation, and comparisons					
Site Development Planning					
45. Land utilization					
46. Structures placement					
47. Form relationships					
48. Movement systems, circulation, and parking					
49. Utilities system					
50. surface and subsurface conditions					
51. Ecological requirements					
52. Deeds, zoning, and other legal restrictions					
53. Landscape concepts and forms					

Services of Architectural Practice	Adequately Prepared (5)	Prepared (4)	Neither Prepared nor Unprepared (3)	Slightly Prepared (2)	Not Prepared (1)
54. Topography and relationship to surrounding areas					
Space Schematics/flow diagrams					
55. Internal functions					
56. Human, vehicular, and material flow patterns					
57. Adjacency					
58. General space allocations					
59. Analysis of operating functions					
60. Flexibility and expandability					
61. Materials handling					
62. Special facilities and equipment					
63. Research of applicable building codes, laws and regulations					
64. Studies of construction market and materials, equipment, and labour					
Design					
65. Building plans and elevations					
66. Selection and layout of building systems and materials					
67. Site planning					
68. Structural considerations (structural components. materials, and systems)					
69. Mechanical considerations (energy conservation, plumbing, Fire protection)					
70. Electrical considerations (power service. lighting, telephone, fire and security systems)					
71. Civil considerations (utilities, fire protection, drainage, paving)					
72. landscape considerations (land forms, ground cover, paving, plant materials)					
73. Interior considerations (furnishings)					
74. Acoustics consideration					
75. Climatic consideration (passive)					
76. Climatic consideration (active)					
77. Lighting consideration (natural)					
78. Lighting consideration (artificial)					
79. Socio-cultural values consideration					
80. Budget and financial consideration					
81. Barrier free design for the handicapped					
82. Creativity and aesthetic consideration					
Presentations					
83. Preparation Architectural drawing and rendering (shade, shadows and perspective)					

Services of Architectural Practice	Adequately Prepared (5)	Prepared (4)	Neither Prepared nor Unprepared (3)	Slightly Prepared (2)	Not Prepared (1)
84. Preparation of architectural models					
85. Preparation of written documents					
86. Client presentation and negotiation					
87. Agencies presentation and negotiation					
88. Committees					
89. Appearances at meetings and hearings					
90. Computer aided designing and drafting					
construction Documents					
91. Architectural drawings					
92. Structural drawings					
93. Mechanical drawings					
94. Electrical drawings					
95. Civil drawings					
96. Landscape drawings					
97. Interior drawings					
98. Alternates					
99. Specifications					
100. Bidding documents					
Bidding/Negotiation					
101. Organising and handling bidding documents					
102. Assistance in bidding and negotiating process					
103. Analysis of alternate systems and materials					
104. Bid evaluation					
105. Preparation of construction contract					
Construction					
106. construction administration - office					
107. Construction administration - field					
108. Field testing					
109. Preparation of supplemental documents					
110. Preparation of quotation requests/change orders					
111. Construction cost accounting					
112. Site supervision					
Post-construction					

Services of Architectural Practice	Adequately Prepared (5)	Prepared (4)	Neither Prepared nor Unprepared (3)	Slightly Prepared (2)	Not Prepared (1)
113. Assistance in establishment of operation and maintenance program					
114. Start-up assistance					
115. Record drawings services					
116. Warranty review					
117. 150. Post-construction evaluation					
118. Project close-out					
Special Services					
119. Renderings					
120. life cycle cost and/or value analysis					
121. Energy studies and/or audits					
122. Tenant-related services					
123. Graphics design/brochures					
124. Fine arts and crafts services					
125. Special furnishings design					
126. Non-building equipment selection					
127. Project promotion/public relations					
128. Materials and systems testing					
129. Demolition services					
130. photographic services					
131. Model/mock-up services					
132. building re-utilisation					
133. Building preservation					

Q.17 The purpose of this question is to determine the extent to which the curriculum of the schools of architecture in Saudi Arabia should address the services required to be performed by students upon graduation in the future.
Based on your experience, could you please indicate the degree of importance of each one of the services below you think the curriculum of the schools of architecture in Saudi Arabia should address in the future.
(Please tick **one** box across each one of the services below)

Services of Architectural Practice	Very Important (5)	Important (4)	Neither Important nor Unimportant (3)	Slightly Important (2)	Not Important (1)
Office Administration					
1. Office management					
2. Office finances					
3. Office marketing (Determination of scope, parameters schedule, and budget for marketing studies)					
4. Office documentation					

Services of Architectural Practice	Very Important (5)	Important (4)	Neither Important nor Unimportant (3)	Slightly Important (2)	Not Important (1)
Project Administration					
5. Contract negotiation and formation					
6. Clients negotiation					
7. English language communication					
8. Report preparation					
9. Record-keeping (time/progress)					
10. Progress reports					
11. Direction off work of in-house personnel					
12. Direction of work of consultants					
13. Preparation and updating of project development schedule					
14. Preparation of written and graphic explanatory materials					
15. Obtainment of building permissions					
Programming					
16. Design objectives, limitations, and criteria					
17. Space requirements					
18. Space relations					
19. Flexibility and expandability					
20. Special equipment and Systems					
21. Site requirements					
22. Research of community attitudes					
Existing Facilities Survey					
23. Photographic survey					
24. Field measurements					
25. Review of existing design data					
26. Analysis of existing structural capabilities					
27. Analysis of existing mechanical capabilities					
28. Analysis of existing electrical capabilities					
29. Development of measured drawings					
Economic Feasibility Studies					
30. Total project cost estimates					
31. Operation and maintenance costs					
32. Financing requirements					
33. Cash flow for design, construction, and operation					
34. Return on investment studies					

Services of Architectural Practice	Very Important (5)	Important (4)	Neither Important nor Unimportant (3)	Slightly Important (2)	Not Important (1)
35. Equity requirements					
Project Financing					
36. Preparing and submitting data, supplementary drawings and documentation					
37. Research of financing availability					
38. Direct solicitation of financing sources					
Site analysis and Selection					
39. Identification of potential site(s)					
40. On-site analysis (soils, topography, vegetation views climate)					
41. Movement systems, traffic, and parking studies					
42. Analysis of deed, zoning, and other legal restrictions					
43. Analysis of transportation, housing, community facilities, and utilities					
44. Site analysis, evaluation. and comparisons					
Site Development Planning					
45. Land utilization					
46. Structures placement					
47. Form relationships					
48. Movement systems, circulation, and parking					
49. Utilities system					
50. surface and subsurface conditions					
51. Ecological requirements					
52. Deeds, zoning, and other legal restrictions					
53. Landscape concepts and forms					
54. Topography and relationship to surrounding areas					
Space Schematics/flow diagrams					
55. Internal functions					
56. Human, vehicular, and material flow patterns					
57. Adjacency					
58. General space allocations					
59. Analysis of operating functions					
60. Flexibility and expandability					
61. Materials handling					
62. Special facilities and equipment					
63. Research of applicable building codes, laws and regulations					

Services of Architectural Practice	Very Important (5)	Important (4)	Neither Important nor Unimportant (3)	Slightly Important (2)	Not Important (1)
64. Studies of construction market and materials, equipment, and labour					
Design					
65. Building plans and elevations					
66. Selection and layout of building systems and materials					
67. Site planning					
68. Structural considerations (structural components. materials, and systems)					
69. Mechanical considerations (energy conservation, plumbing, Fire protection)					
70. Electrical considerations (power service. lighting, telephone, fire and security systems)					
71. Civil considerations (utilities, fire protection, drainage, paving)					
72. landscape considerations (land forms, ground cover, paving, plant materials)					
73. Interior considerations (furnishings)					
74. Acoustics consideration					
75. Climatic consideration (passive)					
76. Climatic consideration (active)					
77. Lighting consideration (natural)					
78. Lighting consideration (artificial)					
79. Socio-cultural values consideration					
80. Budget and financial consideration					
81. Barrier free design for the handicapped					
82. Creativity and aesthetic consideration					
Presentations					
83. Preparation Architectural drawing and rendering (shade, shadows and perspective)					
84. Preparation of architectural models					
85. Preparation of written documents					
86. Client presentation and negotiation					
87. Agencies presentation and negotiation					
88. Committees					
89. Appearances at meetings and hearings					
90. Computer aided designing and drafting					
construction Documents					
91. Architectural drawings					

Services of Architectural Practice	Very Important (5)	Important (4)	Neither Important nor Unimportant (3)	Slightly Important (2)	Not Important (1)
92. Structural drawings					
93. Mechanical drawings					
94. Electrical drawings					
95. Civil drawings					
96. Landscape drawings					
97. Interior drawings					
98. Alternates					
99. Specifications					
100. Bidding documents					
Bidding/Negotiation					
101. Organising and handling bidding documents					
102. Assistance in bidding and negotiating process					
103. Analysis of alternate systems and materials					
104. Bid evaluation					
105. Preparation of construction contract					
Construction					
106. construction administration - office					
107. Construction administration - field					
108. Field testing					
109. Preparation of supplemental documents					
110. Preparation of quotation requests/change orders					
111. Construction cost accounting					
112. Site supervision					
Post-construction					
113. Assistance in establishment of operation and maintenance program					
114. Start-up assistance					
115. Record drawings services					
116. Warranty review					
117. Post-construction evaluation					
118. Project close-out					
Special Services					
119. Renderings					
120. life cycle cost and/or value analysis					
121. Energy studies and/or audits					
122. Tenant-related services					

Services of Architectural Practice	Very Important (5)	Important (4)	Neither Important nor Unimportant (3)	Slightly Important (2)	Not Important (1)
123. Graphics design/brochures					
124. Fine arts and crafts services					
125. Special furnishings design					
126. Non-building equipment selection					
127. Project promotion/public relations					
128. Materials and systems testing					
129. Demolition services					
130. photographic services					
131. Model/mock-up services					
132. building re-utilisation					
133. Building preservation					